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New Method of Recording Candle Power.

[Communicated by DR. LEONARD K. HIRSHBERG, Baltimore, Md., Johns Hopkins.]

The living eye of man possesses the power of registering and integrating an observed phenomenon to only a minute degree. One-tenth of a second after you have seen a thing, there is no visual record left of it. It is completely wiped out. The memory alone has the matter stamped upon it, to be retained and recalled at will, and no visual record, by purely ocular mechanisms, can restore the obliterated picture. We should be unable to see all of the panoramic, changing-phenomena of experience, if such were not the case.

The sensitive plate or film in a photographic apparatus, on the other hand, is able to register and hold any luminous picture that is admitted. To be sure, the first rays that enter produce a stranger effect than each subsequent one; but the stamped result is there just the same.

Thus the camera can do what the eye fails to do; namely, to have and to hold a faithful reproduction of the illuminated object. In fact, because of the tangible shape by which the negative is registered, it surpasses the memory itself, in that we know what we have when we have it. That is, it is before us at all times; at our fingers' ends as it were.

The camera is much more partial to the violet or chemical end of the spectrum than is the eye, hence two side-by-side illuminations, which may appear equal to the eye, coming from different sources of light, may be recorded in a negative far from equal. The filter screen, placed before the camera lens, compensates for this defect and makes the photograph equivalent to what the eye sees.

In a paper describing a photographic method for obtaining the candle power of arc lamps, and other fluctuating sources of light, Messrs. Herbert E. Ives and M. Luckiesch, take advantage of these facts. The lamps tested are allowed to develop their illumination upon a conical surface. The rays of light emanating from this are scattered and enter, during a long exposure, a fairly distant camera. The picture that results on the film is a circular bond of shadows and lights of variable depth. If, at the same time, a series of images of various light intensities are made on the same negative, and these are allowed to fall in graded magnitudes on the zonal surfaces, an approximate determination and comparison between these intensities can be made at your leisure.

The camera, the ray filter, and the films are all standardized in this test, so that the method may be made available for inexperienced observers. The method is, of course, still in the experimental stage, and is offered by Messrs. Ives and Luckiesch as a possible means of overcoming existing difficulties.

By-Product Coke Ovens in the United States.

[From a paper prepared by MR. W. E. HARTMAN, for the Engineers' Society, Western Pennsylvania.]

The prime requisite in by-product oven coking is uniformity of heating throughout the length of an oven, thus producing coke uniformly coked in a minimum length of time. An oven that is designed to accomplish this purpose to perfection can be operated on the shortest possible coking time, being limited only by the refractory qualities of the construction material. Without this uniformity of heating, it is impossible to make any decided reduction in coking time, because of the danger of either overcoking or undercoking some of the charge, both of which faults are detrimental to the quality of the coke. Another feature of overcoking sometimes encountered is the difficulty of pushing the charge, due to the excessive amount of fracture resulting in fine coke or breeze.

It has been found that reducing the time from 24 hours to 16 hours for the charge results in a considerable improvement in the coke, this result being testified to by the blast furnace departments. Shortening the coking time increases the porosity of the coke without decreasing its crushing strength. The product is, therefore, better adapted for furnace use. The writer confidently believes that we will before long see the time when by-product coke ovens are operated on 12 hours coking time. Such results could not be accomplished were it not for the introduction of silica material in oven construction—material worth about 96 per cent. SiO_2. There was great fear of the danger due to this highly expanding brick, which expansion is about $\frac{1}{4}$-inch to the foot, and in the length of the 70-oven battery, 35 inches. It was predicted and expected by some coke oven people that the end ovens of the battery would be pushed off the foundations, but we are glad to say that we are able to take care of this pronounced expansion. The great advantage of this highly refractory material is the fact that we are able to increase the coking temperature in connection with decreasing the coking time, without the danger incidental to the use of less refractory material.

Another feature of note in by-product coking is the increase in the

size of ovens. The ovens built at Joliet in 1907–1908 were designed with a capacity of 10½ tons per charge, and these were then considered large ovens. The ovens of the same type, built since this, have been 12½ or 13½ tons capacity per charge, our standard oven at this date is 15 tons per charge. It would be folly, however, to try to make such decided increases in oven capacity unless the design of the oven provided for uniformity of coking throughout the length of the oven. This 15-ton oven referred to is 40 feet long between doors, 11 feet high, and has an average width of 19 inches.

First Cost and Life of By-Product Coke Ovens.—When beehive ovens can be built for $700 to $800 per oven, including all machinery, while a by-product oven plant costs $12,000 to $18,000 per oven, and the oven battery itself costs about half of this, it is not to be wondered at that the appearance of the first cost is discouraging. But on further consideration we find that the beehive oven that we are figuring on receives a charge of perhaps 6 tons of coal every 48 hours, while the up to date by-product coke oven cokes its charge of 15 tons in in from 15 to 18 hours. With this sized by-product oven and this coking time, it has been found that the cost of construction of a by-product oven is about the same, or a little less than the cost of the beehive oven, figured on the basis of coke production. By this we mean that the cost of the by-product oven battery, including all of its machinery, piping, etc., but excluding that part of the plant for handling and recovering the by-products, compares favorably with the total cost of a battery of beehive ovens, when figured per ton of coke produced.

We have batteries that have been in operation 10 years without any oven wall repairs. Aside from minor repairs, the walls receive the most severe treatment. Again, the writer saw a plant in England where it is necessary to rebuild the oven walls about every two years, due to the fact that the coal used is high in alkaline salts, which unite chemically with the silica of the wall brick. Some coals in this country would result in this same difficulty, but the most of our coals are low in alkaline salts and we can figure on a reasonably long life for oven walls. The battery of silica material at Joliet has been in operation now for about 3½ years, and to all appearance it is good for at least 3½ years more without repairs.

Kind of Coal.—Due to the Steel Corporation's experience with low volatile coal at Joliet, it has come to be generally believed that the best quality of blast furnace coke could only be made by using a low volatile coal or a mixture of coals. The coal used at Joliet was for a long time 80 per cent Pocahontas and 20 per cent Ronco, making the volatile content of the mixture about 20 per cent. More recently Illinois coal was substituted for the Ronco, and more recently still they had a month's run of 60 per cent. Pocahontas and 40 per cent. Klondike. This mixture had a volatile content of about 25 per cent., and it is interesting to note that this coal mixture produced coke far superior to that formerly made. The porosity was higher and the blast furnace results were decidedly improved. There is a by-product coke oven plant at Duluth, using in the ovens ¾-inch screenings from Pittsburgh coal. This has a volatile content of 34 or 35 per cent., and the coke gives very good results in their blast furnaces, the blast furnaces being relatively small.

We have in Germany a large number of plants operating with washed coal containing from 10 to 12 per cent moisture and from 14 to 16 per cent. volatile matter. It is not generally known that coal of this kind can be used without having trouble from expansion during coking, but we have no such difficulties, and we attribute it largely to the fact that the coking processes take place uniformly throughout the length of the oven and thus we have no part of the charge overcoked. This overcoking would result in excessive formation of breeze, which would interfere with pushing the charge.

The specific gravity of the coal has an important bearing on the subject. We have several plants operating in England using very light coal, and the volatile content is about 30 per cent. In order to make metallurgical coke from this light coal it is necessary to compress the coal by stamping it into a cake before charging, while in this country there are a number of plants making good metallurgical coke from 30 per cent. volatile coal without any such troublesome treatment of the coal before charging.

Another important characteristic of coals is the oxygen content. A coal that is high in oxygen requires a relatively high temperature and longer time for coking, and gives trouble through an excessive formation of carbon in the oven and pipes. Also, the gas yield is lower and the quality of the gas is poorer, so that all things considered, it has been found that high oxygen in coal is much more objectionable than high ash content.

Quenching and Screening of Coke.—It is essential that the moisture content of the quenched coke should be very low. In Europe the writer found most of the plants pushing their coke on a wide level wharf; here the coke was quenched with a hose and wheeled by barrows into railroad cars. In some cases this was improved by having inclined wharf, thus reducing the labor item. It may be said that this method did not result in low moisture coke, and would be, with our high cost of labor, an expensive method of handling. In this country we have had the greatest amount of success by using a quenching car. The coke is pushed directly from the ovens into a long open car, preferably lined with cast iron. In such cases the coke is quenched by a large overhead stream immediately after the coke falls into the car. It has been found, however, that quenching the coke right at the ovens is open to objections, because of the large amount of steam produced, this steam having an injurious action on the oven steelwork and brickwork, as well as being disagreeable to the operators, so that the tendency now is to push the coke into such an open quenching car and immediately take this car away to be quenched at a quenching station slightly removed from the battery. It has been recently suggested that quenching can be still more efficiently accomplished with lower resulting moisture if hot water is used, and we are experimenting along this line. The necessity for further improvement in quenching methods is evident from the fact that one by-product coke oven plant has recently contracted for a part of its output on a moisture specification of 1 per cent.

It has only recently been demonstrated that it is poor policy to use run-of-oven coke in blast furnaces. Plants are now being equipped with facilities for screening, and in some cases for crushing and screening their product. Regarding screens, various types have been used, including straight bar, shaking bar and revolving screens. Of these the revolving screen is without doubt the most efficient. A revolving screen not only screens thoroughly but also breaks off any loose particles of coke which would otherwise become fine coke in the blast furnace or cupola. The Steel Corporation's coke plant at Joliet and its blast furnaces have demonstrated to their satisfaction that it is exceedingly advantageous to use only thoroughly cleaned coke, reduced in size to 2 inches or less.

By-Products and Surplus Gas.—It has been predicted that with the increasing introduction of by-product ovens, the market prices of tar and ammonium sulphate would be rapidly lowered. People have been predicting this for the last 10 years, and yet the fact is that prices for these products have been steadily increasing. This is explained by the rapid development of the market, due to the increasing uses for these products. One of the recently developed fields for coke oven tar is its use in Diesel engines, and engines of this type of a capacity of 5,000-horse power and over are in successful use on tar. Tar is previously treated only for the removal of water.

Regarding the surplus gas, it has been found that this can be advantageously used wherever gaseous fuel, either producer gas, blast furnace gas or natural gas, has found application. In this connection we have recently introduced what is known as our "gas ovens" and "combination ovens." The combination oven has been adopted by a number of steel plants in Germany, the ovens being heated with blast furnace gas and all of the gas from the coal being used in the various departments of their steel plants. Among these applications is its use as open hearth fuel. Germany has made more progress in this direction than this country, and has demonstrated clearly that coke oven gas is well adapted for this purpose. An interesting recent contribution on this subject was published in Stahl und Eisen, December 7 and 21, 1911.

The Dempster & Ordish Pusher-Discharger Machine.

In action this machine is exactly comparable with a smooth running passenger lift, inasmuch as it is electrically operated. The motion is imparted by steel wire ropes, and the ram operates its own controller as it approaches each end of the stroke, making overwinding impossible.

However, no form of machinery—even the best—could have a long life, unless kept cool when within the heated retort, consequently the ram is always filled with water, is open to the atmosphere and not at all under pressure; therefore, there is no difficulty in keeping the packed joint tight, hence the machine couples the full advantage of the hydraulic with the flexibility of the electric lift, omitting all the difficulties of hydraulic motive force. It is interesting to note

that the supply of water is such that it never boils, but is kept below the temperature by air cooling in a large tank, hence no nuisance from evaporation occurs. The wear and-tear being reduced to a minimum, as instanced by the first ram installed, which must have discharged considerably over ½ million retorts, and the ropes have an average life of corresponding to the discharging of 30,000 retorts. Our machine can be driven at 50 variations of speed, the motor having a range of from 500 to 1,500 revolutions per minute, in addition to the normal slow starting contact and resistances. In actual work the coke is discharged at a slow speed, thus preventing buckled charges, so permitting the coke to be fed into the producer, the return stroke being made on the high speed, the complete stroke occupying about 30 to 40 seconds according to the coking nature of the coal.

Usually pusher-discharging machines are composed of the three telescopic portions to the ram. This machine consists of two sections only, therefore, generally speaking the machine is simplified in like proportion – viz., ⅔ the wearing surfaces being increased in inversed ratio. That is, 50 per cent. increase, which prolongs the life considerably.

Power for driving the pusher passes through a friction clutch, set to slip at a certain power, hence should a charge buckle, or if the stoker attempted to discharge a retort when the off self sealing lid was closed, no damage would result to either retort or machine.

In the combined machine or complete stoker both the pusher and discharger are mounted on a strong, substantial framework, capable of being raised or lowered within the main frame by rack and pinion motion. The main frame is provided with steel wheels and axles for traversing the retort house rails, with trolley arms for collecting the electric current. The top of main frame is provided with a water tank and coal hopper, usually 25 to 30 cwts. capacity, but made to suit the particular installation. The coal hopper is provided with a feed regulator to the charger, and an index gear, such that the attendant has always a pointer before him, informing him of the progress of the charge as the charging proceeds; therefore, he is enabled to put any measured weight at will without any readjustment of parts.

The machine is fitted with semi-automatic gear for operating any or all the doors in the overhead hoppers, thus the stoker can replenish his supply of coal from his position on the machine platform without loss of time, and the capital cost is kept low.

The power required by the machine is 15-brake horse power for hoisting and 3-horse power for travelling, working out over a long period at 6 brake horse power per motion. There are 5 motions to the machine: Travelling, hoisting, charging, coal feed and pushing; and, of course, the reverse of most of these. As these motions take place separately, the machine is provided with one large electric motor which absorbs current in proportion only to the work done, but which cuts down the electric equipment to a minimum and overrides all pettyfogging details. This is a feature of the machine eminently suited to gas works. As far as possible, the gear wheels throughout are machine cut from mild steel forgings and are as interchangeable, one with the other, as possible, such that one spare wheel will fit a large number of places.

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FOURTH ANNUAL MEETING, SOUTHERN GAS ASSOCIATION.

Held in the Seminole Hotel, Jacksonville, Fla., April 17, 18 and 19, 1912.

Second Day—Afternoon Session.

Communication from American Gas Institute.

The Secretary—We have a letter from the American Gas Institute, dated April 11, which is as follows:

Mr. E. D. Brewer, Secretary, Southern Gas Association, Atlanta, Ga.—Dear Sir: The American Gas Institute is trying to have some one represent it at the various meetings of the Gas Associations, and we have appointed Mr. Wm. E. McKay, of Boston, to represent us at your meeting in Jacksonville, April 17, 18 and 19. We would like very much to have you afford Mr. McKay an opportunity to speak to your Association on the subject of affiliation. We are taking this matter up very earnestly at the present time, and expect shortly to have a report from a committee that has the subject under advisement, with a view to reviewing the present form of agreement, making it more broad and liberal, and extending much greater advantages to State and District Associations. The Pennsylvania Gas Association has just entered into an agreement with us, and we would like very much to have the matter considered by your Association. Thanking you in advance for any courtesies you may extend to Mr. McKay,

Yours very truly, Geo. G. Ramsdell, Secretary.

In the Matter of Affiliation.

The President—I have pleasure in introducing to you Mr. Wm. E. McKay, of Boston, who has been delegated to represent the American Gas Institute at this meeting, in connection with the matter of affiliation.

Mr. McKay—Happily indeed it chanced to be possible for me to be in Jacksonville during the meeting of your Association. A week ago today I was at a meeting of gas men in New York city, and amongst those present was Mr. Geo. G. Ramsdell, Secretary of the American Gas Institute, who had just returned from a meeting of the Pennsylvania Gas Association, to whom he had presented the question of affiliation. Learning that I was coming here, he asked me if I would accept the proxy to act for him in behalf of the Institute and of its Directors. With your permission, I will first read my credentials, as delivered to me by Mr. Ramsdell, which will explain how I happened to present the statement:

New York, April 19, 1915.

Supt. W. E. McKay, Boston, Mass.—Dear Sir: Learning that you will be in Jacksonville, Fla., during the time of the meeting of the Southern Gas Association, let me say we are trying, as far as possible, to have someone represent the Institute at the various State and District Gas Association meetings. As it is impossible for me to attend the Southern meeting (I find that Mr. Copley cannot be present), and also learn that you are going to be there, I would ask you to represent the Institute for us. We would also like (having opportunity to do so) to have you bring up the subject of affiliation. We desire very much to have the State and District Associations affiliated with the Institute, if it is possible. I might say, in this connection, that I personally visited the Pennsylvania Gas Association at its meeting in Williamsport this week, where the subject of affiliation was taken up and explained. This resulted in the Association entering into an agreement to become an affiliated member of the Institute. The only thing I can say to guide you is that the matter of affiliation is in the hands of a committee, who will make a report at the next meeting of the Board of Directors, when the advantages of affiliation will be more apparent than ever before. We now have four Associations affiliated with us: The Illinois, Iowa, Wisconsin and Pennsylvania. Anything you can do for us in this connection will be very much appreciated. Yours very truly, Geo. G. Ramsdell, Secretary.

Mr. Ramsdell, in sending that letter, also sent a copy of the agreement drawn up with the Pennsylvania Association. With your permission, I will take a second to read it:

In virtue of an agreement made this ——— day of April, 1912, between the American Gas Institute and the Pennsylvania Gas Association, to affiliate under the terms of Section No. 55, of the Constitution of the American Gas Institute, the aforesaid Pennsylvania Gas Association agrees from this date to confine its election to membership to persons directly identified with gas interests within the State of Pennsylvania.

The Pennsylvania Gas Association further agrees to consult with the Institute before undertaking any original work, and to do each year, in co-operation with the Institute, a certain amount of original work.

The American Gas Institute agrees that the Pennsylvania Gas Association shall be entitled to elect one of its members a member of the Board of Directors of the Institute, the member so elected to be in addition to the 15 members of the Managing Board of the Institute, provided for under Section No. 23 of the Constitution. * * * This agreement by either party can be terminated on 6 months' notice.

Mr. President, practically that is all I have to present on behalf of the Institute. Personally, I would like to take this opportunity to express the pleasure I had in the character of the reception accorded me as soon as I stepped into the Seminole. I think I had hardly been in the hotel 3 minutes without knowing anybody before I received a guest's badge and tickets and invitations for more than there are 24 hours in a day. I think you ought to be congratulated in meeting in such a live city and in reality such wonderfully comfortable quarters. Jacksonville strikes a Northerner as one of the liveliest places in the United States. Every year I come here, I can see that it has grown, and certainly, during this meeting, the strenu

ous efforts of the stenographer to get the speakers shows that you can hear it grow.

The President—Mr. McKay—What action have you in mind that we should take?

Mr. McKay—If I might suggest, Mr. President, I think if either the Broad of Directors of your Association or a committee appointed and acting under the instructions of your President, took this matter under consideration and communicated direct with Mr. Ramsdell you would obtain any details that you want. The Institute desires to get this before you so that you could begin to consider it, and to act and operate under it. Certainly an affiliation drawn on the proper lines will work to the mutual advantage both of the local Association and of the American Institute itself.

On motion of Mr. Brown (seconded by Mr. Ferrier) it was ordered that the communication be received and referred to the incoming Executive Committee.

The President—We will now go to the first paper on the programme for this afternoon, by Mr. Roscoe Nettles, of Tampa, Fla., entitled,

THE MAN AT THE HELM OF THE GAS BOAT.

In the absence of the author, the paper was read by the Secretary as follows:

When a man is chosen to manage a gas company it is understood that one of the requisite qualifications he possesses is a practical working knowledge of the manufacture of gas, the details of distribution and the conservation of supply. Without this he would be impossible as a permanent manager of a company that expected dividends on its investment. He would be like the old darkey who had a job hauling water to a mill, who was always so busy, whistling and thinking what a good job he had fallen into, that he paid no attention to the road and he could not have walked from the mill to the spring, after he had been working for a week, to save his life. One morning he went to harness the mule and found him sick in the stall. Rastus was worried. He went to the owner of the little mill and told him the mule was ill and there would be no water hauled that day.

"I'll fix that," said the mill man; "I'll borrow a horse from one of the neighbors."

"Looky harh," answered Rastus. "Does disyher haws youse is gwine aftah know wharh that tharh spring is? Casin if he don't they ain't no use gitting him. That tharh mewl is the only one of this outfit that knows wharh the watah is. Foh de Lawd, that's de truf!"

Getting the Good Will.—But there are qualifications that the successful gas manager must have to enable him to carry his company forward year-after-year and continue to pay dividends on the original investment, as well as keep the plant up to standard. Two of these I desire to bring before you as comprehensively as possible, for, to my mind, they are the most important of the problems which confront us in the management of this peculiar line of business. These are: The ability to secure and hold the goodwill of the public, and the ability to build up a staff of employees who will work toward the same end; in fact, the building up of such a staff may well be included as one of the steps toward that Utopian condition when the gas company stands in the community as a friend to the public, having the confidence and esteem of the people upon whom it depends for its existence.

To foster goodwill there is no more powerful, and at the same time more subtle, agency than frank publicity. Our own experience in the Tampa field proves this so conclusively that I feel justified in presenting to you a brief outline of what we have accomplished in this city in a single month.

How Publicity Won Confidence.—On the evening of the 13th of last December, we were called before a committee, composed of the Mayor of the City of Tampa and members of the City Council. We were asked to show cause why our rates should not be lower and our service better. At the time we had been in possession of the Tampa plant just long enough to realize that we had a most difficult proposition; we had inadequate machinery, a deplorably inadequate holder, small mains and service pipes carrying twice the load that they should have been called upon to carry, and the least uniform pressure it is possible to mis-devise.

Our President, Mr. Gribbel, and our Vice-President, Mr. Collins, came from Philadelphia to attend this meeting. We laid before the committee a complete expose of the condition of the plant and the difficulties under which we were laboring, promising remedial changes at the earliest possible moment. We pleaded for time, for an arrest of judgment as it were; and, though given with reluctance on the part of some members of the committee, we were granted the time in which to prove whether we were in earnest in our promises.

Naturally, we remedied every defect as soon as it was physically possible; but we could still hear murmurings through January. Our respite had not been long enough to enable us to accomplish everything necessary to rehabilitate the plant and the system of distribution; the plant could not be enlarged in the period of patience, and we were about to become once more the target for official as well as private attack. While things were in this condition we determined upon a campaign of publicity—frank, open, true discussion of the things that we had found upon entering the field; what we had done to remedy them and what plans we had for the future, together with the probable time it would be necessary to wait for these improvements to be made.

On the 27th day of January we started this campaign of publicity. We announced that a series of articles on the subject of "The Gas Situation in the City of Tampa" would be run in the two daily papers of the city, immediately after we held our opening and demonstration in our new offices. This opening and demonstration took up a week, and by careful publicity, not large space or flashy announcements, but dignified, frank statements attractively printed, we so filled our large office that it was practically impossible to seat the people. I believe that during the week not less than 2,000 people visited our office.

Following this, we gave a series of articles just as we had outlined. Each, complete in itself, set forth, in a carefully worded manner, the exact conditions existing in the gas plant, the gas office and in the homes we were supplying with gas. We told what we had accomplished in 60 days, and the consumers of gas in Tampa were surprised. We told what we were spending on a new holder, new mains and new gas machines, and they were still further surprised. We told exactly how complaints are handled, and they awoke to the fact that their complaints had been answered and the trouble remedied in a manner and with a dispatch never before thought of in Tampa. We told them everything, except rate reduction possibilities; these we held back as a pleasant surprise.

When the series of articles ended, although our service was not one whit better than it was when we started this campaign of publicity, we had satisfied consumers, where before we had connections that the owners looked upon with disfavor. The people were discussing us, but not in the same spirit that had actuated a discussion of our business the month before; they had seen that we were frank, and, by reason of the continued publicity, each day giving an entirely new thought, we had impressed them with our fairness and desire to be square with them. At the time this is written (February 26th) although we have not announced a penny's reduction in the price of gas, the people are friendly to us and are willing to listen to our salesmen or to read the announcements we make through the press.

Let Your Staff Grow Up in Work.—Right in the line with the establishment and continuance of this friendly feeling on the part of the public, is the method I believe best in organizing a staff of employees. It is absolutely essential for the man at the helm of the gas boat to have his working force in harmony with him at all times; and it is just as essential that the employees work in harmony with each other.

I believe, and I have an example of accomplishment in our own office to strengthen my belief, that the most certain way to secure a staff of harmonious workers is to take young men from your own city, break them in to conform to the work as sytematized in the office, and keep them advancing along the line as rapidly as they advance in their ideas and their accomplishment.

Particularly is this true in the commercial department. With 50 or 100 young men from the home city, each of whom has at least a score of close friends who can be induced to install new gas appliances from time to time, you have established the basis of a business that cannot be taken from you by competitors or by circumstances. These men, working together and to a common end, spread the gas propaganda throughout the city, and at night there are 50 or 100 homes in your territory where one of the principal topics of conversation is gas.

Association Work and Library Room.—One of the strongest assets of a gas company is a coherent working staff, and the expense of fostering a spirit of comradeship and co-operation among the employees is one of the greatest dividend makers in the business. With an Association of the employees, a hall for meetings, a library for consul-

tation and lounging when off duty, they have incentives to study, to interchange of ideas and to good habits, which make for successful accomplishment on the morrow.

With careful planning on the part of the manager of a gas company, he can have such a force, such an element of comradeship running through it, and, perhaps greatest of all from the company standpoint, a loyalty on the part of his men that spells dollars at the end of every fiscal year and is the most accumulative asset in the business.

Going after Street Lighting.—While it is a detail, and not one of the fundamental essentials of the class we have been discussing throughout this paper, I cannot close without calling the attention of the managers of gas companies, particularly in the Southern territory, to the neglected opportunity in so many cities—that of street lighting.

There is no valid reason why every city, not owning its own plant, should not share its lighting contract with the gas company. In every instance it is a company paying taxes to the city, with a big investment in the city, and its field is restricted to the limits of the city or its immediately adjacent environs. These certainly are reasons that no city can afford to answer with a refusal, and the gas manager will find that a few hundred street lamps on a flat rate will give him the basis for a volume of gas that will materially reduce the cost of operation proportionately to the amount manufactured.

I have not attempted to cover the thousand and one duties of a gas manager. I have merely brought out a few points that I believe will suggest some new ideas to the able men who are managing the companies in this Southern territory, but I do believe that the greatest success cannot be attained by any gas company without the co-operation and moral support of the community in which the plant is located and in whose soil the mains are planted.

Discussion.

The President—The paper by Mr. Nettles is before you for general discussion. Mr. Spencer S. Weart, Vice-President and General Manager of the Sun Vapor and Gas Street Light Company, signified his desire to me of speaking on this subject.

Mr. Weart—I don't know that I have anything to offer on Mr. Nettles' paper; but the suggestion on page 5, "Going After Street Lighting," strikes me as a point on which I might give the Southern gas man some assistance, in addition to what Mr. Nettles says about the South being backward in street lighting in every city. In the vast territory south of Richmond, Va., south of Cincinnati and east of the Ohio river and Mississippi, there are just three cities in the South that have over 100 incandescent gas lights in their streets. Two of these cities are in Florida—Tampa leads the list with 1,000 street lamps; Pensacola has 130; Charleston about 600. The gas men have looked at it in the light that a single candle burns only 3 feet per hour, and a street lamp on a street means a small consumption of gas, overlooking the fact that a gas lamp on a street burns 4,000 hours a year, which means 12,000 feet of gas per year for a single mantle light, and that a contract of 100 lamps practically means to a gas company a consumption of at least 100,000 feet of gas per month. Now, in regard to the gas white way. We hear a great deal of the great white way, and there can be practically no great white way except with gas. Gas is the only white way that is white. The electric white way is really a red light way. I don't want to burden you with a lot of figures, but before coming here I got hold of some figures of a gas installation now in use for a period of 10 months. The installation was on natural gas, using 5 globes and 10 mantles to a standard; that is, a gas of 1,000 B.T.U.'s. This installation started off, June, 1911, with fifteen 5-light standards, and wound up in March with 62 standards, or an average of 46 standards for 10 months. This installation used an average of 59 mantles per month, 5.7 top globes, and 11.6 lower globes for repairs on 46 standards. This, on the basis of a year, figured 15 mantles per standard per year and 4½ globes per standard per year. There might be some question raised as to weather conditions. As to the operation in winter time, taking December, January, February and March in that city, the thermometer got as low as 22° below zero, and a great many snow, wind and rain storms occurred during that period. In that time there was in operation an average of 60 standards per month. These standards use 322 mantles, or at the rate of 80 mantles per month; 35 top globes, or at the rate of 9 per month; and 54 lower globes, or at the rate of 12 globes per month, showing the average for the 60 standards of 16 mantles and 4.6 globes per year per standard, meaning that the average breakage in the winter time was only 1.10 mantles and .10 of a globe higher in the winter months than the operation of the lamps for 10 months, which included the winter period.

The President—Gentlemen, while we are on this phase of the paper, I would like to hear from any other lighting concern.

Mr. Pierce—I am sorry I cannot really discuss this question of street lighting inasmuch, as the Company I represent has no connection whatever with the Welsbach Street Lighting Company, which handles all the street lighting end of the business. Therefore I am unable to speak from that standpoint at all; but what I do wish to emphasize is that this great white way movement, which has been so heavily capitalized by the electrical companies, is a very profitable load. It's the general practice to install these standards generally running all the way from 3 to 5-lights per standard, on both sides of the street, and from 40 to 60 feet apart, so they will present a vista throughout the length of the street of softly illuminated globes. They are not so useful from the standpoint of producing illumination, as higher intensity units would be best, but principally for decorative effect. The electric companies have been very successful in obtaining business of that character, and if you will look through the *Electrical World* for the 2 years, picking out the installations that have been obtained and comparing those installations with that they would represent in consumption if operated by gas, you will see there is a very, very profitable field which has been—I think you will agree with me—sadly neglected, and it's a field that should be gone after vigorously. One reason why gas light in this connection is superior to electric light is on account of the color of the light. If we could get a few gas standards of that or any other character, or gas lights of whatever character, on the streets where there are electric incandescent lamps you could easily show up the inferiority of the latter in respect to color very forcibly. Regarding the best units for street illumination, as I said before, these are not really street lighting propositions, they are street decorating propositions. The intensity of illumination obtained from the lamps is not very high, for they are generally installed on streets where there is sufficient illumination, from show windows and signs, etc., to furnish all the illumination that the street needs. Nearly all well lighted business streets have illuminations of that sort; for instance, take Broadway in New York. It isn't necessary to turn the city lights on at all; in fact, you couldn't tell whether they were on or off simply by looking at the street, for 9-tenths of the illumination comes from show windows and signs. The various merchants associations over the country, boards of trade, etc., who have shown activity along this line are responsible for the great white way agitation that has been capitalized by the electrical interests. I believe one will find, in nearly every case, that this business may be obtained for gas at a very satisfactory profit, serving further as well as a very fine advertisement.

The President—Any other discussion on the paper of Mr. Nettles'? If not, then, with your permission, I will now read a prepared contribution to the discussion handed in by Mr. H. W. Frund:

"A coterie of men were one day discussing the merits and demerits of commission form of government, conservation of natural resources, regulation of quasi-corporations and kindred subjects. One of the speakers remarked that a chief difficulty of the problems of to-day was lack of proper education of the masses. For illustration, he said "Partisan politics should be eliminated altogether from municipal affairs." If voters studied carefully this proposition and governed their ballots accordingly, we might have a better condition of affairs in our government of cities and towns. Taxes might be lessened, and public money be more economically expended. This same proposition of education can be made with regard to a better feeling between a company and its patrons by teaching them more about its business. Apropos of the paper by Mr. Nettles: While the net result of the analysis of his discussion shows that the manifold duties that fall to the "Man at the Helm" are numerous, exacting and irregular, and that it is not possible in most cases to execute all plans which he might conceive, nor give his best efforts to any plans that may be suggested. There is, however, an important work for men holding so responsible a duty, in the care of many thousands of dollars of invested capital represented by the physical value of plants, to properly care for the same and to obtain therefrom the highest economy, efficiency and returns, he should avail himself of every aid in his power. He must school and train employees in order to have good men, loyal co operative help, and he must also use all his power to educate the masses in matters appertaining to his trust. This is evidenced by the glowing picture of the progress made by civilization. Nine-tenths of the problems that confront us come from progress, and will be solved as we have solved other

problems as they arose; the other tenth comes from prejudice and should be left alone until the prejudice has dissolved. There is every reason to be optimistic despite the fact that our newspapers are full of the news which begets and sustains calamity howlers. We are important factors in a community. I know of no other commodity produced which is more essential to the comfort, well-being and protection of any community than that which we produce; and yet, though its importance is known and felt in every home, shop, office and work room, I venture to say that no other pronuct is so little understood by the user. This being so, it is our duty to do some educational work along lines which will bring about the better understanding of our product, and which will be followed by its more intelligent use. The first essential of the teacher is that he shall know, and have some definite specific knowledge of his work. Take for illustration the subject of light. One of our chief difficulties, as purveyors of this, is in the intangible nature of our product; that is to say, if the flow of gas could be perceived as easily as the flow of water can, many of our troubles would quickly disappear; but the average consumer knows nothing of our product, or of the measuring devices used for registering their consumption. Few of them understand reading the meters, and, as for heat units and candle power, these are all as so much Greek to them. Certainly the time is ripe that we should qualify to do a little teaching, which will assuredly be most effective did we go about it the right way. It is surprising how much a little application will do along these lines. In these days we must specialize. It is generally conceded by those qualified to speak authoritatively, that almost, if not quite, 50 per cent. of the artificial light produced, is lost. This, not by reason of the carelessness of the consumer who neglects to turn off gas when not needed, leakage, etc., but simply through a lack of intelligent use of the product purchased in installation and distribution, with the result that the consumer fails to get anywhere near the full benefit of his purchase. We would be apt to criticise the shopkeeper who sold us a water nozzle for flushing streets or washing windows, that was originally made for spraying a soft flower bed or sprinkling a lawn; but we stand in just his position when we sell or recommend to a consumer an appliance not suited to his specific purpose. Take the matter of holophane, for instance; to many of us, perhaps, a holophane globe is simply a holophane globe. A customer asks for one to use over a reading desk or table, and how many of us know just the type to recommend? Now, the three types, A. B. and C. are scientifically designed for three different purposes, and if we select the wrong type we do the customer and our company an injury by giving him an appliance which does not enable him to get the best efficiency from our product. The result is that, to get more light, the consumer employs more burners, thereby increasing his bill unnecessarily. This brings a high bill complaint all from the lack of a little intelligence Under these conditions certainly a trifle of educational work is in order, and it is with this view and thought that I say it is our duty to not alone instruct and teach our customers in the economical use of gas for lighting, but also in the use of various gas appliances numbering more than 700. I believe most firmly that, when we have even partially accomplished this education, we will have not only fewer complaints, and customers who are friends rather than knockers, but we will at the same time have also increased the volume of business as does the merchant of all classes when he pleases and establishes confidence." [Applause.]

On motion a vote of thanks was passed to Mr. Nettles for excellent paper.

Committee on Ventilation.

The President—Prior to taking up our last paper I desire to say that, at our 1911 meeting, at the suggestion of the President (H. W. Frund), a Committee on Ventilation was appointed. That committee was composed of Messrs. T. D. Miller (Chairman), J. Ferrier and J. N. Cook. Mr. Ferrier will submit the findings for his associates.

Mr. Ferrier—Before reading the report it may be well to speak a few words in explanation. Mr. Miller was not able to attend, through having been very busy in other matters. However, we met in Chattanooga last January and compared notes. At his suggestion, I drew up and sent to him a form of report which I thought would be about the right thing. I didn't hear anything from him until the other day, when I got a letter in which he said he thought the presentation was too voluminous for a committee report. Having conferred with the other member of the committee (also Mr. Redding) they preferred to have the report read as originally prepared. I have both, and will read the original (also the abridged), it will be optional if the Association wishes to print it in any form.

Report of Committee on the Hygienic Effect of the Use of Gas.

To the President and Members, Southern Gas Association: The subject presented is so extensive and important that the utmost your Committee can attempt is to review the result of recent investigations and present the conclusions that appear to be justified by these investigations.

This twentieth century will probably be known as the "Sanitary Age;" or, in other words, the age in which the prevention rather than the cure of disease became the chief aim of the medical world.

A living atmosphere as near as possible to "open air" conditions is one of the great desiderata in sanitation. The important requisites of such an atmosphere appear to be:

(1.) A certain proportion of oxygen fresh from contact with vegetation.

(2.) A limited proportion of CO_2.

(3.) Absence of organic matter, whether in the form of active germs or simple cells.

The first of these requisities—that oxygen "revitalized" by recent contact with vegetation is essential—seems to have been established by the experiments of Dr. Richardson some 25 years ago. The permissible limit of CO_2 has been considerably modified as the result of recent investigations, it having been established by experiment that as great a proportion as ½ per cent. does not cause reduced vitality. Even as rigid an authority as Dr. Haldane is quoted as saying that 20 parts in 10,000 may be breathed without physiological detriment. As to the third requisite, there seems to be no exception to the rule demanding the total absence; or, if not, the torpidity of organic matter as an essential of a hygienic atmosphere.

Argument is unnecessary to demonstrate that the conditions above described cannot be attained, much less maintained, in buildings as at present generally constructed, whether for residence, business or educational purposes. A room cannot be inhabited without promoting conditions adverse to the three requisites above given. Conditions may be modified by the use of doors, windows and ordinary flues; but only in a partial and unsatisfactory degree.

It may, therefore, be asserted, without fear of contradiction, that a constant renewal of the atmosphere of a room is absolutely necessary for the maintenance of that atmosphere in a hygienic condition—which plainly signifies that means must be provided to secure an unintermittent expulsion of the vitiated atmosphere with a concomitant influx of fresh air to take its place, to render a room fit for healthful habitation.

It is now time to inquire how the use of gas, whether used for lighting or heating, affects hygiene under present conditions, and what would be its effect under improved conditions. Let us suppose two inhabited rooms, without special means of ventilation, one lighted by electricity, the other by gas. In the first there will be three reversals of hygienic conditions, to wit: A diminished proportion of oxygen, an increased proportion of CO_2, and an increase of organic matter. In the second (lighted by gas) there will be two reversals slightly, but only slightly, aggravated, viz., diminished quantity of oxygen, increased quantity of CO_2; but, as far as organic matter is concerned, a distinct improvement caused by the sterilizing effect of the gas lights. We have *supposed* these conditions: but they have been verified by actual experiment. One of us (J. F.), in 1901, found that the diminution of oxygen never amounted to 1 per cent., even under the abnormal condition of a room closed tight for 5 hours with gas lights and a flueless gas heater both in use. The CO_2 never exceeded 32 parts in 10,000, and was sometimes as low as 13. Recent experiments (as related by Mr. Pierce) have shown that, in inhabited rooms lighted by electricity as compared with those lighted by gas, the difference in the proportion of CO_2 was practically negligible, while in the latter case, the organic matter soon became nil as against a serious increase in the former. It may be only a coincidence, but it is a fact that the growing demand and need for perfect sanitation and ventilation and the increase in percentage of infectious diseases are coextensive with the introduction and development of electric lights and the electric fan. The latter has an agreeable effect in removing a heated envelope of air from the body, but its effect in bringing dust and germs into the breathing zone renders its use, in a hygienic sense, questionable. Experiment seems to establish the fact that, in closed rooms, the vitiation, as far as oxygen and CO_2 are concerned, ceases to increase when the temperature becomes stationary. The probable explanation is that the generation and loss of heat are accompanied by a circulation of the air, resulting in a sufficient ventilation, even when doors and windows are closed. It

is to be feared that most medical men who have recorded their preference for electric lights, on hygienic grounds, have founded this preference more on theory than on fact ascertained by experiment. Passing to conditions which would obtain were buildings constructed, as they should be, with special means of ventilation, it is here that the use of gas becomes a potent agent in securing healthful atmospheric conditions. The burning of gas produces a column of hot air which rises towards the ceiling, thereby creating a circulation of the air, so that gas lights have not only the effect of sterilizing, but of renewing the atmosphere when suitable openings for efflux and influx are provided. Gas lights provided with tubes for carrying off the products of combustion have been used with marked success for ventilating purposes. The unused energy represented by the heat of the gas light can thus be made highly beneficial, and no doubt will be extensively utilized in this manner, especially if gas men will set the pace and put their energies behind the movement. It may be put down as an axiom that, whatever may be the ebb and flow in the course of competition, the business will ultimately go to those who supply the most energy for a given sum. It is, therefore, true business policy to see that all energy is beneficially applied.

We have not touched upon the effect of moisture produced by the combustion of gas. The moisture produced by burning 1 cubic foot of gas would measure about 1.25 cubic foot were it to remain in a gaseous condition, which it never does, being condensed by contact with walls and other surfaces. Considering the great amount of light now produced from a small volume of gas, a simple calculation will show that the quantity of moisture added to the atmosphere of a room is almost negligible, apart from the fact that a slight addition of moisture is, under certain conditions, a positive benefit.

Conclusions.—1. No interior atmosphere can be considered hygienic, unless means are provided for a continous influx of air (preferably filtered and washed) together with an accompanying expulsion of vitiated air.

2. Few buildings to-day are provided with such facilities for ventilation. Doors, windows and ordinary flues are but haphazard means to that end, ventilation being only an incident in their utilization.

3. Fven when buildings are not specifically equipped to take care of ventilation, gas lights are more beneficial than otherwise.

4. Where rooms are equipped with ventilating openings, the use of gas lights is highly beneficial, and flueless gas heaters, of proper design, permissible if not positively beneficial.

5. That the efforts of the gas industry generally should be directed towards securing proper construction, whereby the surplus energy of gas would become a necessary assistant in securing hygienic conditions, thereby promoting the welfare of the business and at the same time not only meeting but routing the critics on their own ground.

References.—R. F. Pierce: "Illuminating Engineer," September, 1911, in which specific mention is made of the experiments of Rideal and others.

"Gas World," June 24, 1911. "Light and Heat in Artificial Illumination," by D. W. Voege; *ibid*, Dec. 30, 1911; *ibid*, "Gas Hygiene," by E. Othmer, Berlin; *ibid*, Jan. 13, 1912. Questions in gas manufacture and supply by City and Guilds Institute.

Besides the paper by Dr. Rideal, already referred to, reference is made to papers by Vivian B. Lewes, G. Stanley Cooper, Prof. Eisman and others.

T. D. Miller,
James Ferrier,
J. N. Cooke,
} Committee.

The President—You have heard the report of the Committee on Ventilation. What action do you desire to take? [A motion to adopt the Report was seconded.] This means that it will be incorporated in the minutes of our "Proceedings." I would like to have an expression (from Mr. Ferrier in partiuular) as to what form you would like to have the report appear in the "Proceedings."

Mr. Ferrier—I would like to have that decided by the Association.

The President—Let the report be received and Mr. Ferrier be requested to prepare it for the "Proceedings." If Mr. Ferrier will please take these two reports, and just as soon as possible send what you desire to appear in the "Proceedings" to the Secretary. [Concurred in.]

Mr. Pierce—You will likely agree that if it is a pertinent matter as regards lighting, it is 10 times more pertinent regarding the use of gas for fuel, and that it is highly desirable to transmit correct information bearing upon the use of gas and its effects to interested persons, such as physicians, heads of hospitals, factory boards of inspection, architects, and so forth. At the last meeting (Williamsport) of the Pennsylvania Gas Association a committee was appointed (of which I have the honor to be a member) to consider ways and means of placing in the hands of architects information regarding the uses of gas appliances, their merits, proper methods of installation of appliances, etc. We decided to prepare a pamphlet bearing upon the application of gas, setting forth its advantages, and making recommendations as regards the arrangement and size of piping, etc., the best location of windows and their construction, in order to provide ventilation, especially in kitchens, and the construction of ventilating ducts where possible, the object being to persuade architects to locate gas outlets as far as possible in every room of every building. I would like to submit for your consideration, under the proper order of business, the desirability of similar action on the part of the Southern Gas Association. The requirements of the South are peculiar, and while the work we are doing in the Pennsylvania Association will, of course, be offered to the gas industry of the United States, at the same time there are peculiar eonditions existing in the South which make it desirable for this Association to appoint a committee to undertake a similar work; and under the proper order of business I should like to submit that for your consideration.

The President—Then you will get that in form so it can be submitted later?

The President introduced Mr. S. E. DeFrese (Chattanooga) who read the following paper on

OPERATING A GAS WORKS WITH NEGRO LABOR.

In this article it will be the purpose of the writer to give you his experience and opinion in substance, which will be in keeping principally with the operation of a gas plant with negro labor.

Realizing that we are all awake to the interest of the companies we represent, to the extent of producing the best results obtainable under existing conditions, and also realizing our inability to accomplish these things only through the material assistance of those men who are daily carrying on the less important part of the work, I would have you agree with me, if only for the time being, that the most valuable asset a gas company, or in fact any other company can have, is largely in the class of labor employed to do the work. There are many arguments which might be used by the writer to convince you of these facts, and many forceful illustrations and examples could be employed, but we shall waive these, for I shall presume that you agree with me.

Considering, therefore, that we have many problems which may be successfully worked out, not only through the employment of modern machinery, retort houses, tools, and other accessories necessary to the production of gas, let us consider the best plan or system by which labor may be used more efficiently, more advantageously, and more profitably, to obtain the results sought.

While we are considering these things of vital importance to all, let us remember that in our Southland there has been drawn in years gone by an imaginary line in the field of labor, and that this line has said there are two classes of work in this field, and that certain work has been allotted to the white man and a certain class to the negro.

Some of us have learned from experience that this condition does exist, and outlined our work accordingly. Others have not seen the reason why we should not select men according to their worth and ability, without respect to color. I am quite satisfied the latter managers and superintendents are in the minority.

It is my opinion that here it is, not only essential but positively necessary, to draw a distinct line between negro and white labor. The negro is beyond question the best stoker for us to have. I speak of him particularly in this line, because it is principally the most important part of our work we have for him to do. When properly trained and carefully handled, he becomes a reliable, strong and skillful laborer. Improperly trained, he becomes a most unreliable, incompetent and disgusting laborer. In this State he has probably dampened the ardor and ambition, causing the feeling of disgust to evidence itself, and trampled on the aspirations of more than one manager, superintendent or foreman.

I trust I am speaking to those who have stood at the gas plant the night after payday, waiting to see our colored "friends" arrive for the night shift. Many of us can remember how we have looked at our watch, and mentally noted it was getting late, yet several of the crowd had not arrived. It occurred to us at the time that we did not see how we could possibly afford to let the stokers' benches stand idle that night. How we looked at the holder, which was rapidly sink-

(*Continued on page* 74.)

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[Official Notice.]

Educational Classes (1912-13), National Commercial Gas Association.

Office of the Secretary and Asst. Treas., 29 West 39th Street, New York.

To the Members of the National Commercial Gas Association: The Committee on Education, after considerable deliberation, has decided that the educational work of the Association, which consisted of a Correspondence Salesmanship Course during the year 1911-1912, should be continued for another year, and the scope of the course considerably extended.

For the season of 1912-1913, beginning September 1st, there will be two classes, one practically the same as that just completed, to be known as Salesmanship Course, Part I., the other, to be called Salesmanship Course, Part II., which will be an advanced course, and include a study of the relations which exist between every department of a gas company, especially between the selling department and the advertising and distribution departments, including a thorough course in business organization, correspondence, follow-up systems, the functions of the complaint desk, etc.

Cost of Entering the Classes.—Only members of the Association will be eligible to the courses, at $5 each. Payment may be made, either in advance for the full cost of the course, Part I. or Part II., or on a monthly basis of $1 until the full amount has been paid.

Certificates of Merit.—Upon the completion of the courses, those members who are in good standing and have satisfactorily answered the questions which accompany the lessons, will be awarded certificates signed by the President, the Secretary, the Chairman of the Educational Board, and Dr. Galloway, Director of the Classes.

Forming Company Classes.—An endeavor will be made to form classes wherever sufficient numbers of men from any company are enrolled in either class, the company or members to select some qualified person to conduct the classes. The leader will keep in close touch with Dr. Galloway, and thereby keep informed as to the correct answers to all questions and problems in the lessons. In this manner the leader will be able to interpret, for the benefit of the class, a correct understanding of the lessons.

Therefore, starting September 1st, a meeting of all those enrolled in the course should be called at the office of such companies where there are enough members to form a class, to select the leader and prepare for the year's work.

Advisability of Joining the Classes.—The original course, now known as Part I., will be repeated, to offer an opportunity to new members in the Association, or those who did not take the course last year. Part II. will be of much greater benefit if members have first taken Part I.

When to Enroll.—Members may enroll in the classes at once, and this is advisable. Although active work will not start before September 1st, subscriptions sent to the Secretary, 29 West 39th street, New York City, at this time, will enable the Committee and the Directors to gauge the prospective size of the classes and facilitate a more satisfactory mapping-out of the work.

Assuring you of the earnest desire on the part of the Officers and Directors and Educational Committee to be of service to you personally, and soliciting your co-operation in this educational work by an early reply, I beg to remain, Yours very truly,

Louis Stotz, Secretary and Asst. Treasurer.

BRIEFLY TOLD.

Ventilation Standards.—The subject of ventilation is a live one, both in and out of the gas business. The report and discussion at the meeting of the Southern Gas Association, on the subject (which will be found on pages 70 and 71), contain a remarkably clear and able statement of what ventilation means, what good ventilation is, and what effects are produced when gas is burned. Special emphasis should be placed upon the methods of measurement, for there seems to be a general impression afloat, at least in this country, that if air be forced in a room that the air will be pure and that, therefore, the ventilation will be good. As far as gas is concerned, the standard should be based upon the quantity of CO_2 at the breathing level, and this is the standard of the factory inspection in England (20 parts CO_2 in 10,000 volumes). The advocates of legislation on this subject in this country have specified an arbitrary quantity of air to be supplied for every cubic foot of gas consumed, and this figure has been as high as 1,200 cubic feet of air for every cubic foot of gas burned. While it would seem apparent that the actual conditions would present a much safer criterion, there is a likelihood that some legislation will be enacted based upon a quantity of air requirement which might prove embarassing to the industry. It is a matter which should have the earnest attention of the fraternity, and we would welcome any information concerning proposed legislation in this respect.

July Meeting, Employees, Bronx Gas and Electric Company.—The regular monthly meeting of the Bronx Gas and Electric Company was held the 10th inst. The Committee in charge seemed very reticent regarding the programme, which, to some extent, helped to bring out the largest attendance to date; for although the women are always blamed for possessing an overportion of curiosity, yet this same disease often shows itself with marked pronouncedness in the male sex; and our boys show slight traces. However, the Committee was glad to see this, as it helped repay them for their efforts. Arrangements had been made with the management of a moving picture theater near the office for the use of its hall for the evening, so, after assembling at the office, all hands pro ceeded to the hall, at 8:10. President Rosenquest and Supt. Butler were among the first to arrive, and their presence always lends a jovial air to such occasions. Mr. Fred. Towers, the Electric Station Superintendent, gave a very interesting talk on the growth of the electric business over a period of 15 years, drawing clear comparisons between present and former conditions, showing how, gradually, the boiler capacity had increased from 450-horse power to over 6,000-horse power at the present time. Mr. Towers certainly interested his hearers with his clear, non-techical history of the station's growth. Mr. Wm. Page followed Mr. Towers on the programme, with a ta lk on the manufacture of gas as his topic. Truly he knew his subject, for he has had complete charge of this work from the beginning of the Company's history, when he made gas only 8 days a month, pumped drips, painted buildings, doing other odd jobs between times. In those early days, one man made the gas, carried the coal to the operating floor in baskets and cleaned his own fires. All of the gas in those days was made in one little set which compared very favorably in size to an ordinary, good-sized, ashcan; but, as years passed, new machinery and larger holder capacity were installed to take care of the ever increasing demand for the product of the Company. Mr. Page concluded his talk with a clear description of gas manufacture as made by the Lowe Process. Mr. Wm. A. Root, the Company's Commercial Manager, was next on the programme. He opened with a paper on the necessity of commercialism in its every detail by all central stations, and emphasized the fact that every employee of the Company, regardless of the position he held, was its representative, and all should acquaint themselves with the uses to which gas and electricity adapt themselves in everyday life. After concluding his paper, Mr. Root entertained the assemblage with an illustrated talk on the uses of gas in the home and factory. The applause accorded each speaker proved the Committee had been successful in the agents selected to please its audience. Mr. Raine entertained with a vocal selection, accompanied by Mr. Towner on the piano. Talent (our boys are full of it) and Mr. Towner can "scare a piano to death" the way he makes it send forth music. Returning to the Company's office, all enjoyed a nightcap in the form of coffee and sandwiches, and it is surprising to see how talkative men get when they are fed. Perhaps a good way to get good discussions would be to feed the audience after each speaker. Eleven-thirty found the last fellows leaving for home, wondering how the next meeting could be better; but knowing we will be well entertained we will surely be on hand. —A. R. W.

CURRENT MENTION—

THE first grand outing of the New England Section, N. C. G. A., was held at Bass Point, Nahant, Mass., Saturday, July 20th, with over 200 members present. Ideal weather conditions greeted the members, and the sail down the harbor was a most enjoyable one. Our Boston friends acted as guides to the members from the outside companies, and pointed out the many places of interest that Boston harbor is noted for. The members were met at the Bass Point landing by the Committee on Arrangements, who escorted them to the Bass Point House where a group picture was taken. The programme of events opened with a 75-yard dash, which was won by H. F. Austin, of Newton, with J. F. Hayden second. The throwing of the 16-pound shot was won by A. A. Ferguson (Boston), with P. J. Dooley (Roxbury) a close second. There was a large list of entries for the potato race, which was finally won by H. F. Austin, of Newton, with R. A. Fancy, second. The baseball game between the married and single men was interesting while it lasted, the married men putting it all over the bachelors, the score being 7 to 1. Mr. E. N. Wrightington, Vice-President of the Boston Consolidated Gas Company, officiated as umpire, but was not called upon to render any close decisions. At the close of the sports, the line of March was headed for the banquet hall of the Bass Point House, where a genuine, old-fashioned South Shore fish dinner was ready to be served. One of the special features that scored a "hit" was the singing of verses written by A. H. Vegkley, to the strains of popular melodies. The Committee, consisting of Messrs. C. H. Stevens and F. W. Mace, of Lynn; A. H. Vegkley, F. J. Dempsey and Charles Daly, of Boston; and C. E. Paige, of Malden, deserve much credit for the good work they had done to make our first annual outing a great success.—"M."

"C. E.," writing from Melrose, under date of the 24th inst, says: A meeting of the employees of the Malden and Melrose (Mass.) Gas Light Company was held at Marie Hall, Monday evening, July 8th. Supper was served at 6:30, after which Mr. C. E. Paige, Superintendent, called the meeting to order, stating that the subject to be discussed was the "Workingmen's Compensation Act," which became a law July 1, 1912. He then introduced Mr. A. B. Tenney, Vice-President of the Company, as the speaker of the evening. Mr. Tenney explained very clearly and carefully the nature of this law, as to how it affected the workingmen in case of injury, and advising the employees that the Company had provided insurance covering them, giving the amount of compensation which they would receive, which was graded according to the extent of the injury. He also stated that it was optional as to whether they accepted the protection offered. At the close of Mr. Tenney's remarks an opportunity was given for the purpose of asking any questions on which the employees might wish further information. Music was furnished during the evening by an orchestra.

BOOK REVIEWS.

Modern Illumination.—A compact, descriptive work, well illustrated, by Messrs. H. C. Horstman and V. H. Tousley. Published by F. J. Drake & Co., Chicago. Price $2. The authors have aimed to present readable, descriptive matter, covering the whole field of illuminating engineering in condensed form and in simple style. And they have succeeded admirably, considering the state of the art and the fact that simplicity sometimes covers the fault of looseness. Any practical worker could, however, absorb much that would be of value, and those desirous of obtaining information more specific in detail, and of broader scope, can really find the material in older works. Many recommendations are given; and, in the majority of instances, few would find fault with them.

Gas World Analyses of Gas Companies' Accounts, 1911.—A comprehensive analyses of the accounts of 53 British gas companies, covering the year 1911; published annually by the *Gas World*, and for sale by the AMERICAN GAS LIGHT JOURNAL. Price $4. This volume is now ready for distribution. The companies listed range in size from 50 millions cubic feet to 25 billions cubic feet per year. The percentage of carburetted water gas made averages from zero in 26 cases to 45.9 per cent. Data is given on no less than 48 items.

Correspondence.

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

High Pressure Gas for Industrial Purposes.

AMERICAN GAS FURNACE CO.,
24 JOHN STREET, N. Y. CITY,
July 22, 1912.

To the Editors, AMERICAN GAS LIGHT JOURNAL: Referring to the July issue of the "Bulletin" of the National Commercial Gas Association, I fail to agree with the replies made to Questions Nos. 1 and 2, on page 269. Question No. 1 reads: "Has high pressure gas been used for industrial purposes, taken direct from high pressure distributing systems?"

As to the statement made by the gentleman (Mr. George S. Barrows, Philadelphia, Pa.) who answered this question, which answer was in part: "In this country high pressure gas has not been used to a very great extent, probably because the line of development happened to start along that of air-blast appliances rather than that of pressure gas appliance." This finding would seem incorrect from the fact that furnaces used for air-blast were not used until a considerably later date than the high pressure gas appliances. In other words, the Bunsen system was used a great many years for industrial purposes prior to the time air-blast appliances were brought into use. This statement can readily be borne out by anyone who wishes to investigate it.

Respecting Question No. 2, "For industrial purposes, which can be used to better advantage?" I have pleasure in answering same, feeling assured that any of your interested readers will agree with the presentation and consider the same as accurate and trustworthy; for it is based on many years of experience.

As a general proposition, especially to heat inclosed space such as that in an oven or muffle furnace, the correct answer is: "High pressure air is decidedly preferable, and in some cases indispensable." Why? Because—

First.—The air always constitutes the greater bulk in the combustible mixture, and draws in the smaller proportion of gas easily and positively.

Second.—If the gas must draw in a much bulkier mass of air the draft is proportionately less positive, and regulation is more difficult.

Third.—Where the combustible mixture of gas or air can be constantly used, "pressure gas" will give fairly good results; but where changes of proportion are required, as is the case where a furnace is used for both annealing and hardening, the blast is decidedly preferable, and the use of two valves instead of one becomes necessary.

Fourth.—No good reason for using "pressure gas" instead of "blast" has yet been discovered, either as regards economy or efficiency.

Fifth.—Thirty years' ample experience condemns the "pressure gas" theory and leaves it applicable only in rare cases where duplicate piping is objectionable.

AMERICAN GAS FURNACE CO.,
P. F. REICHHELM.

Mr. Conroy on "Gas as an Illuminant."

GENERAL GAS LIGHT COMPANY,
46 WEST BROADWAY, N. Y. CITY,
July 20, 1912.

To the Editors, AMERICAN GAS LIGHT JOURNAL: In the issue of the JOURNAL, dated July 1st, is published (p. 2) a lecture delivered by Mr. V. R. Lansingh, on "Gas as an Illuminant," in which the statement is made that the gas arc is inferior to the single burner in efficiency of light production. This is a serious error, which should be corrected, both for the sake of those commercially interested in gas lighting and for illuminating engineers, whose information with reference to light production should be accurate as well as unbiased.

The Welsbach Company, in its published statements, gives the following figures relative to the efficiencies of its inverted gas arc (Intenso), and its single burner (Reflex):

Type of Lamp.	Cubic Feet Gas per Hour.	Lumens.	Lumens per Cubic Ft.
Intenso	14.43	3,922	271
4-light Reflexolier	12.60	2,151	170

The following figures are from tests furnished by the Electrical Testing Laboratories:

Type of Lamp.	Cubic Feet Gas per Hour.	Lumens.	Lumens per Cubic Ft.
No 30 Humphrey arc	12.28	3,720	302

It will be seen by the above figures that the "Intenso" arc lamp has an efficiency of 59 per cent. greater than that of the 4 single unit and that the Humphrey No. 30, shows an efficiency of 77 per cent greater than the single units. The Humphrey arc was tested with standard mantles and equipment, and the results given are not the highest ones obtained, but represent a good working average. Of course, it is presumable that the Welsbach tests were likewise made under standard conditions. This increase in efficiency is far too great to be accidental, nor should it be neglected. In fact, it represents, under the best conditions, twice as great an increase in efficiency over the best form of single mantle lamp that the tungsten electric lamp shows over the carbon filament lamp, which it is rapidly replacing. Just why the gas arc shows so much higher efficiency than the single burner may be left for the scientist to determine. Whether it arises from the preheating of the gas and air mixture, or the conservation of heat by the close proximity of the several mantles, or from both, opens up an interesting scientific question, although its answer may or can have no practical effect, since the fact is already thoroughly established. Gas men in general and illuminating engineers, too, should understand and recognize the fact, and be guided thereby in their respective fields. We remain yours very truly,

GENERAL GAS LIGHT COMPANY,
J. P. CONROY, Manager.

(*Continued from page* 71.)

ing under the peak load, and how we had sent the foreman, fireman, or head stoker out to look for these men, or to pick up anybody, in order that we might make the night through. Unless you who are present have at some time in the past travelled this road, I fear my suggestions or advice will be uninteresting and unprofitable. However, I have little doubt but that few of you have had these experiences.

In order that we may correct these troubles it is essential we be careful of the character of the men whom we employ as gas works' foremen. The man who occupies this position should be a man who is a master, sober and honest, and a worker. He should be mentally and physically able to do and direct the work he is engaged in. He should have the stamina and courage to accept responsibility, and should be of the type of man who is exacting, is not satisfied except by complete obedience, and a careful fulfillment of his orders. He should also have a keen insight into the minutest detail of the work. He must be a man who realizes that to make good means to further his own interests and gain for him recognition in his chosen work. He should know the best method of operating his plant, should play no favorites, and show absolutely impartial treatment to all. Last, but most important, he should know what constitutes a day's work. When he is this kind of a man, you can rest assured he will have the support of the negro. The negro will learn to obey and love him, and will evidence support by loyalty to the leader. They will work for him with all their might, that they may gain from him his look or word of approval. You can hear them boast of him on the street, and hear of their refusal of offers of other employment.

I will repeat an incident that happened in the writer's career as gas works' foreman, and I trust you will receive it in support of what I have just said.

Many years ago, in Chattanooga, a negro was lynched by a mob of white men. The details of the affair are of no consequence or concern to anyone here. The day following this lynching the negroes in all parts of this city were surly and impudent. By nightfall their attitude assumed a most threatening manner. Word was passed than the town was in danger of being burned down, that the negro's life might be avenged. About dusk that day our office was called over the telephone by an unknown party, who said there would be no gas lights that night, that the mob would visit the gas plant, stop the work and shut the gas off the street mains. Things looked gloomy. The sheriff, to cope with the situation, had sworn in a large number of deputies, and the police department was in readiness.

Naturally, we expected some of our men would be absent from their work, having been influenced to take part in the trouble. It occurred to me that it would be well to have a little talk with them. Shortly before quitting time I went to the retort house and spoke to each man individually, cautioning him to take no part in the disturbance, to go peacefully home and attend to his own business. There was not a man on the night shift off that night, and every man was on duty next day.

Considering that there were over 2,000 negro laborers employed on various plants who refused to work during the time of which I speak, I feel that our plan of handling our men resulted in our success. Our system of handling all of our help is as follows: In the first place, we do not permit a negro of uncertain character to work in our retort houses. In order that we may find out what kind of a negro he is, when first employed we give him a trial "on the yard." If he conducts himself properly, he is then eligible for trial in the retort houses, at such time as we may need him. In this way there is little mingling or associating with bad characters. We consider a man can be easily spoiled by association with disreputable characters. Again, we seldom put on a stoker who comes from a gas house in some other city. Experience proves that these men usually have various tales to tell their friends, how much money they made at some other plant, or how much easier it was to do the work there, etc. With some men, in fact, I might say the majority of negroes, these statements carry much weight and are apt to cause trouble; at least, this has been our experience.

We had an experience one time which proved the value of training our own men, letting the experienced wanderer alone: We had employed a big, husky negro, who was a good one, from a neighboring city. Hardly had he begun work with us until he had our men believing that they should have more money, their jobs were too hard, their work should be laid out differently, and many other things. The result was some of our men were led to believe him, and nearly all of them gave him their support. One Saturday night they came to me in a body, asking for more money. There was only a short session, for in a few minutes I told them to go back to work; we would think the matter over and let them know our decision. Meanwhile, I assure you, we lost no time in finding the cause of the trouble, and having satisfied ourselves that it came from the new man, we immediately let him go. Several days afterwards, perhaps a week, thinking this matter over carefully, we called at different times each man individually into the office and told him we regretted very much that he was going to leave us, and that realizing he had at all times proved himself a good, honest, reliable laborer, we felt it was no more than right and justice to him that he carry with him our recommendation to his new job; that it was a pleasure for us to vouch for so good a man.

You will probably realize how a statement like this would be taken by a negro who had been with us many years, and who had no knowledge of what was coming. Invariably the answer to this question from the negro would be to say that he did not have a job to go to, that he did not want to quit us, but had just come along with the balance of the crowd, having been asked to do so, and that the new negro had urged him and the rest to ask for a raise, etc.

We advised him as to the policy of having something better in view before quitting a job, and other things which would bring about his realization of what had transpired. Of course, we put him back to work, and suffered from no trouble of this kind afterwards; but this simply goes to show how easily a good organization can be influenced by one man, and how often a little thing may give you much trouble. So our plan is to train men, letting the experienced stoker from other cities alone. To train a man carefully, requires much time and patience. One of our rules when training a stoker is to see that he does all his work. The foreman is in touch with him continually, teaching him how to draw and charge, and how necessary it is for him to properly ream his standpipes, and to see that no retorts are charged that have holes in them, without first being patched, also to take care of his tools, and to clean his place after each charge, to take a pride in his work, for on it depended his securing the place. In other words, we set a high standard, attaching as much importance as possible to the position which he is trying to fill. He appreciates it is a better paying position, and that the work is more regular than that of the day laborer on the street; and if you can get him thinking this way, you will find that he will take much interest in his work. Naturally, if he is a man who is proud of his job, he will take a keen insight at the start. It is then the time for the foreman to carefully watch every move, calling his attention to any disregard to the slightest detail of the work. In a short time you will have this man feeling that everything he does is seen, and that if he makes a failure he may lose his place, or be sent back on the yard.

It is also very important that a clear understanding should exist between both foreman and laborer when this man is put on. If you intend keeping him in the retort house regularly, then do it. If you are only training him for a place later on, he must also know that; and then when the time presents itself, you must give it to him. At no time must there be any misleading statements to him from you. The negro may not possess the virtues of truthfulness and honesty; but he has a deep regard for them, and expects to find them in you. Again, a most necessary thing, in order to successfully operate your works with negro help, is a strict obedience to the following rules:

1. No drinking allowed on the works.
2. No gambling.
3. No women permitted in the works, except to carry meals; and then they must give the men their baskets and go away.
4. No one permitted to leave the works between charges.
5. No quarreling or cursing.
6. Have no negro foreman; and do not allow negroes to give orders to each other. If you have not a white foreman, it will pay you to get one.
7. No one is allowed to lay off without permission.
8. Every man to attend to his own work, letting his fellow workmen alone.

These rules will work no hardship on the laborer, and I think you will all agree that you would not hire a man who would not agree to live up to them. You will also agree that one seldom finds violations of these rules by new men. This being the case, I am quite satisfied, if you keep your men fully acquainted with these rules at all times, and see that they are not violated, and that those who violate them will be punished, you will have less trouble with your

men, and will produce better results. I think the character and behavior of the men and the appearance of the gas works reflect directly on the ability of the man in charge. If he is a good man and a skillful manager, his men and plant will show it; further, he will be able to sometimes make a good competent laborer out of a poor one. On the other hand, if he is a poor manager, easily pleased, careless and slothful in his habits, his works will show it; and you will generally be introduced into his plant with a supply of excuses for this and that, which he is ashamed for you to see. Producing results in gas works with negro help is far from being a hard job. You will find negroes work better for a strict master than for the one who has allowed himself to get within the negro's control.

Another very important thing to think of (as a rule it is neglected) is the habit of allowing the negro to lay off a day or so whenever he pleases, without your permission. We have a plan which has been tried for several years, and which has helped us materially in regard to this matter. We go through our plant two or three times a week, sometimes oftener, for the purpose of offering a man a day off. We inspect regularly our time book, and can tell at a glance the number of days a man has worked since he last laid off. We call his attention to this; and, while we do not force him to lay off, we offer him the opportunity. If after that he lays off without authority to do so, we suspend him, letting him rest until we are ready for him to come back. Of course, there are exceptions, such as accident or real sickness; but no other excuse goes.

We must all realize that there are few jobs around a gas works which are easy. Stoking is indeed very hard work, and we will all agree that after a man has worked 12 hours a day for 30 days at this kind of labor he is entitled to rest. If we permit other men to absent themselves of their own accord, it works an injustice to the regular men; and you will find that, unless you offer him a day off now and then, he will soon lay off of his own accord, and will get into the habit of making excuses, and will not have the regard for your orders that he would have had, had you treated him the right way to start with. Of course, it is difficult sometimes to get negroes into your way of thinking, but if you keep persistently after a plan of this kind the negro will learn to adopt it, and will cause you considerably less trouble.

I remember a big negro, one of the best workers we had, who got into the habit of getting sick the day after payday. He was afraid to break our rules for a long time; but finally he took a chance, and failed to show up next day after payday. He was back the following day, trying to look as ill as possible, and was very anxious to go to work, although he said he was hardly able to do so. We suspended him a couple of days, with a lecture. This lasted 2 weeks, and "Bill" did the same thing the following payday. Coming around the next day, he had quite a lengthy story about being poisoned, etc. So we cured "Bill" with his own medicine. We took a lot of stock in the story, and told him how sorry we were that he had been so close to death, and urged him to immediately return home as fast as possible, fearing a relapse. We kept him off for a couple of weeks with this kind of treatment, finally, when we let him come back, he obeyed the rules thereafter.

Our work at Chattanooga is divided to suit our conditions. We have a deck floor in our retort house, and the coal supply is some distance from the benches. We find it a very good plan to have one man operate two benches. His duty is to draw and charge, ream his standpipes, and help fire his furnaces. Our furnaces are fired with hot coke, and we use a chute to feed the furnaces. He draws the coke into a self-quenching coke chute, and this is taken care of by one man in the cellar. This man can wait on 14 benches of sixes, has time to keep his place clean, and to load all the coke that we sell on board railroad cars. We have a narrow gauge railroad track in the cellar of the retort house, and use a circular dump tram car, which holds 1 ton, for carrying out coke. We have a tipple for loading cars, and a coke trestle, so that coke may be stored in our yard. It is this man's duty to take care of all coke that does not go into the furnaces. We have two men (known as coal men) whose duty it is to furnish all coal used by the stokers and also to assist in firing two-thirds of the furnaces. It is also their duty to keep clean one or more of our retort houses, which is idle, to trim the coal stock, and unload all of the coal from the cars.

We also have one man who looks after the clinkering of the furnaces and who attends to the remaining one-third of the firing. It is this man's duty to keep that part of the benches under the charging floor in good order, and to point up any cracks in the recuperators.

There is one man on top of the benches, whom we term a head stoker; and it is his duty to attend to the hydraulic main, keeping all joints tight, and ream from the top each standpipe every day. We consider, while this is not absolutely necessary, it is a very good plan to ream the standpipes from the top. It requires only a few minutes per bench, and the result is that you know the pipes are at all times absolutely clean. He also patches all leaks in the retorts, and looks after minor repairs. He is ready to fill a stoker's place at any time. While he is head stoker, he does not give orders, but reports to the foreman during the day time and to the engineer at night. We have no night foreman, this responsibility being placed on one of our engineers. We have two engineers, both white men.

Our plan for advancement is to promote the yard laborer to a coal wagon man, and from this position to a stoker. We pay stokers $1.80 for 12 hours; coal wagon men, $1.70; and the cellar man, $1.80; furnace men, $1.70; head stoker, $1.80. We do not allow our furnace men to change with the stokers, neither do we allow the coke men this privilege. This plan has worked out very satisfactorily, and also pleases the men. We are not bothered from so many sources for changes.

In our boiler room we employ negro firemen only, 1 man day, 1 man night. It is his duty to keep an even head of steam, and we check his work with a Bristol recording gauge. To begin, he is placed with the old fireman, and, after he is considered competent, he must make good in all respects, or we soon replace him with another man. He is in full charge of the boiler room, and allows no idlers or working men to disturb him. He keeps his boiler tubes clean, the front of his boiler painted, and all brass work is cleaned each day. He also keeps the windows and floor clean; and, unless he can do these things, we do not consider he is the man for the place. We do not permit, in the slightest degree, any carelessness on the part of firemen in the boiler room. We consider that if we are strict with him concerning all details in this work that he will carefully look after the very important things. He will see that, when his boilers are down, his gauges are clean, that no scale obstructs the water column, and that these are cleaned out regularly and properly looked after. Should we allow him to keep a dirty, filthy boiler room, and a fluctuating head of steam, and clean his fire whenever he chooses, to do other things when he pleases, we would expect to have trouble of perhaps a very serious nature.

On the yard, one man to pump drips and tar, make up our purifying material, and to keep the yard clean. We also have one man who looks after our breeze bin under the tipple, and assists in hauling fuel to the boilers, to clinker the water gas set and fill the generator. He is also the helper to a white mechanic who looks after repairs of all kinds. This negro is also capable of being a stoker, and is trained in that capacity as rapidly as possible.

One negro, whom we term a porter, keeps the inside of all the buildings, where men are not engaged at work, clean. By this I mean he cleans the engine rooms, condensing rooms, the purifying and ammonia plant, and cleans the office and Pintsch gas rooms. He is also trained to take a stoker's place. Every room is cleaned each day, and the foreman and engineer inspect his work; all brass work and machinery are polished each day. There is just enough of this work to keep one negro busy.

We also have a negro hostler, attending to all of the stock, who also drives a team of mules, delivering the tar, coke, etc. He keeps the barn in neat order, repairs the harness, and looks after small repairs. We do not tolerate any dirt in his department, and his stock must show that he attends to his work. He has the key to the barn, and everything pertaining to this department is in his charge.

It has been my purpose in this paper to draw your mind to a few points which we are quite satisfied in some places are neglected, and which are so essential to producing the best results from negro labor. Under these rules and plan it has been possible for the writer to have with him a number of men, the majority of whom have been with us many years. This in my opinion is best evidence of their being satisfied, and their faithful work has resulted in producing a gas plant which we are not ashamed for any of you to visit at any time you may choose.

If you will think these things over carefully, you will see the necessity for a systematic plan, not only of handling the men, but one which will produce a clean gas works, and a crowd of men who will appreciate the place and who are willing to obey your rules.

(To be Continued.)

MR. R. M. CHILDS is still acting as receiver for the possessions of the Medina (N. Y.) Gas Company.

Effect on Gas Coal Storage in the Open.

The Committee intrusted with the direction of the Instructional and Experimental Gas Works of the Association (German Gas and Water), at the meeting of the German Gas and Water Association this year, submitted a memorandum on the effect of prolonged storage on lump gas coal. A sample was examined when fresh from the mine, and a further sample was also "observed," following a storage of 912 days in the open. The results of these examinations and comparisons are printed in the following table:

Gas Coal as Affected by Storage in the Open for 30 Months.

Coal.	Fresh.	Stored.
Temperature of setting, degs. F.....	2,138	2,129
Period of carbonization, hours.....	4½	4½
Gas made per ton of true coal, cubic feet at 60° F. 30 in., and saturated	13,127	13,762
Gross calorific power, B.T.U. per cubic foot at 60° F. 30 in., and saturated.....	602	560
Calorific valuation figure, B.T.U. per ton.....	7,902,454	7,706,720
Specific gravity of gas.	0.431	0.421
Ammonia, per cent. by weight of true coal.....	0.259	0.2945
Sulphur in purified gas, grains per 100 cu. ft...	8.78	10.58
Coke, per cent. by weight of true coal.....	66.0	67.0

The coal had not changed appreciably in chemical composition or calorific power by storage, and nearly the same calorific valuation figure was obtained on distillation. Again, the stored coal afforded more gas of lower calorific power than the fresh coal, and the coke had fallen off in quality. It is observed that it will be interesting to make similar investigation on a number of coals (since different descriptions may be expected to behave differently in this respect), and also on various sizes of coal.

The Centenary of a Great Invention.

The *Metal Worker*, in editorial comment on the subject named in the heading is led to remark: One hundred years ago, to the accompaniment of much incredulous talk and opposition on the part even of the scientists of that day, was chartered The Gas Light and Coke Company, of London.

This marked the first commercial and organized effort to utilize the discoveries of William Murdoch, and the others, now forgotten, who to some extent had preceded him in divining the possibility of producing lamplight without a wick.

The immense benefit to mankind that the discovery of the process of manufacturing coal gas has proved to be, like many of the other inventions and discoveries of the early years of the last century, was beyond the comprehension of the people of that time. The almost laconic announcements that now mark the introduction of inventions, that only 100 years ago would have been looked upon as either supernatural or ridiculously impossible, denote the progress of man, intellectually, physically, and in the arts.

Will the Edisons, Marconis and Wrights of to-day be as completely forgotten by the man in "The Street" 100 years hence as William Murdock, the real and undisputed discoverer of coal gas as a utilitarian and commercially profitable possibility is now? The memory of man is proverbially short to those to whom he is indebted. The world owes much to William Murdock, perservering student, brilliant mechanic and dogged fighter for recognition. It might at least perpetuate his memory, in one or other of the fashions that have been considered worthy to honor the names of those with far less claim to fame.

Special English Correspondence.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, July 10, 1912.

The Institution Meeting.—Centenary Festival of the Gas Light and Coke Company's Workers.

The topic that looms most largely at present is the recent meeting of the Institution of Gas Engineers, which was in every way a success. The powerful personality of the President seemed to pervade the whole gathering, with the result that from the delivery of the inaugural address, which was an excellent pronouncement that had the effect of setting the tune for subsequent speeches, until the final vote of thanks, there was no hurry and no hitch. The President applied the "closure" in regard to a discussion at the right moment, a step that might be taken with advantage much oftener than has been the case in the past, and that not only with regard to particular subjects, but as applied to particular individuals. But it must be admitted that the faculty for using this weapon effectively is exceptional. Last month I remarked on the poorness of the papers to be read, so far as the quantity is concerned, but this does not apply to the quality. The papers submitted were well conceived, and met with the sympathetic reception that they fully deserved, and some of them were a prominent monument to the industry as well as to the ability of the author. Mr. Townsend presented a scholarly investigation into the incidence of the day load, bringing out the numerous factors that control this important branch of our business. The fundamental difficulty is that no one knows exactly what his "day" load is, nor is there any certainty as to what the term means. Some regard it as the consumption during the hours of daylight, say between sunrise and sunset. Others, as the consumption between 6 A. M. and 10 P. M. over the entire year. Others again appear to have in view the proportion of gas used for purposes other than lighting. Whatever the standard taken, it is impossible to separate out the different branches of consumption, or to avoid a large proportion of lap. There are cellars, underground stores, dark passages, etc., where gas is required for lighting throughout the entire hours of daylight. And the users of gas engines, friers and cookers do not necessarily limit their consumption to anything less than 18 hours out of the 24. One occasionally hears the expression "point of saturation" used in connection with slot meeters or cookers, but it cannot be too strongly understood that there is no definite point of saturation. It is only a relative term, having reference to the present methods of doing business, which may or may not be the best suited to the district. Then the percentage of the day load, as compared with the whole output, is decidedly misleading. A may be doing better with a 40 per cent. day load, than B with a 50 per cent., because he has a large night load. His day output may be actually a greater quantity of gas per head of population if it is a smaller percentage. A large factory, carrying expensive machinery and running all night shifts, may be introduced into the district with the result that the percentage of day consumption is reduced although the quantity remains unaltered. No one would call that a misfortune. The question of differential rates, of course, found its supporters, but it did not take that prominent position in the discussion that it would have received some years ago. It may be desirable and even unavoidable, in some districts, but most managers have found that it is not an all-round success, and that there is always the man on the other side of the fence to deal with. A discount of 5d. per 1,000 cubic feet or so on gas used in gas engines may encourage the use of gas for motive power, but it does not please the consumer who uses as much or more gas for some other purpose, and gets no discount. The conclusions arrived at by the author that flat rates are preferable to differential prices, except for power and industrial purposes, and that it is better to reduce the price all round as much as possible, in preference to giving discounts either for large consumption or prompt payment, fairly represent the general experience. It must not be forgotten that in many districts, the price has already reached a limit that is no hindrance to business, and that further reductions, that is, such moderate reductions, are compatible with a steady growth of business and improvement in productive methods, are not likely to increase the consumption. But improved service, attention to complaints, a good maintenance system, educative work on the lines of showing how to get the best value out of the gas consumed, a good show room, etc., will exercise a notable effect as regards increase of business. An expenditure equal to say 2d. per 1,000 cubic feet on the cost of gas, will bring in a return far exceeding anything that would be gained by a corresponding reduction in price. Many concerns who formerly spent practically nothing on these lines have realized this point and are now spending 2d., 3d., or even 4d. per 1,000 cubic feet, to the satisfaction of all concerned. Increased business enables them to supply a good article at a popular price.

An interesting feature in connection with the discussion on this paper is a substantial addition in the form of communications sent for inclusion in the printed proceedings. This practice is usual with the Institution of Civil Engineers, but it is distinctly a novelty with our Institution. It has the advantage of enabling the large family of diffident men who, or what comes to the same thing, believe that they are "nothing of a public speaker," to take a part in the proceedings. Apart from that, it often happens that some point is suggested

by subsequent informal discussion, or that one has some notes or memoranda at home, or not for the moment available, that are of use in connection with the subject.

Mr. Mennier's description of the evolution of Stockport Gas Works reminds the older members of the profession of the numerous changes that have taken place within their experience, as instanced by comparing a gas works of the first magnitude as it stands to-day with its predecessor of 50 years ago. This rapid development of original detail, and the addition of new branches, may well be characterized as evolution. The operations at Stockport are represented by an increased output of from ¼ of a million to 3 million cubic feet per 24 hours. And not the smallest advantage of an evolution of this description is the facilities thus offered for the scrapping of the old plant, in favor of not merely larger, but of the best and most modern types of apparatus. A glance at the numerous drawings with which this paper is illustrated—and in a case of this sort the drawings are of more value than any amount of letterpress—will show that this point has been fully labored at Stockport. The descriptions of modern gas works that are available for the use of the student are none too numerous, and the paper under consideration is a useful addition. When we consider that stock patterns of gas works are now obsolete, and that the circumstances in each locality necessitate totally different designs and treatment, it is to be regretted that a larger number of our leading engineers have not followed the excellent example set by Mr. Charles Hunt and Mr. W. R. Herring, by publishing illustrated detailed descriptions of modern gas works.

The one modern detail of gas supply that found a place and a name in the programme, was high pressure gas for manufacturing purposes, which may be regarded as the latest addition to the numerous departments that come under the care of the sales and distribution departments. It was fathered by Mr. A. W. Onslow, who probably knows as much about the practical side of the question as anyone, seeing that he has for some years been following it up at Woolwich Arsenal. This new development may be said to be as yet in its infancy, but it has great capabilities. With the passing of the flat flame burner there is no longer any necessity for measuring the gas supply pres sure in tenths of an inch of water. And if we develop the technical and the heating department it will no longer be possible to do so for another reason. The question of the sizes of distributing mains will have to be considered, in conjunction with the available space for them under modern conditions of public service, in our leading thoroughfares. The comfortable, easy going, old fashioned arrangement of sewer in the center, gas main on one side of the road, water on the other is no longer practicable. If we are prepared to substitute small tunnels for leading gas distributing mains, there is no room to place them. So that in many districts the question of a higher distributing pressure is forcing itself into notice, even if accompanied by a reducing arrangement or step down transformer at the inlet of the meter. The question of measuring gas at high pressure has already been solved, and meters specially adapted for that purpose are already on the market, and are furnished with index corrected to atmosphere pressure if required. Mr. Onslow deals with several practical details, and gives the results of his experiences, including a rough sketch of a workshop lighted and heated by gas at 65 to 80 inches pressure.

There are other matters in connection with the Institution meeting, such as the reports from the several committees, respecting which one would like to have something to say, but space must be reserved for some notice of the celebration of the centenary of the Gas Light and Coke Company at the Crystal Palace, about 10 miles out of London, on Saturday last. It says something for the traffic capabilities of the metropolis, when we mention that 14,000 persons from the various stations belonging to the Company, were able to make their way to the popular holiday resort, and to return home in comfort and safety, a journey in some cases of 20 miles. The task of providing meals for that number is well calculated to strain the resources of the largest contractors, but the caterers at the Crystal Palace were equal to the occasion. It is needless to say that an event of this kind could not be arranged with most elaborate organization covering some weeks beforehand, and the sympathetic support, not only of the Governor of the Company, but of the whole of the Directors and the leading heads of departments. It was a unique occasion. A centenary only comes once in a man's lifetime, and the visitors on Saturday have never attended a similar festival, and will never have a chance of attending a second. The London gas men know how to work and how to play, and they did not hesitate to make the best of the occasion. Music was provided by four military bands, composed entirely of employees. The day was passed in usual holiday style, sports, amusements, two substantial meals, etc. The only formal part of the proceedings was a gathering in the large theater at 3 o'clock, to which admission was secured by ballot, because there was no building large enough to house the whole party. The Governor of the Company, who was received with cheers and musical honors. delivered an appropriate speech, and votes of thanks were proposed and seconded by employees. Comparing the position and renumeration of the workers in 1812 with those of the present day, the Governor alluded to the great improvements that had been effected, and gave some useful advice. The workmen speakers took occasion to refer to the benefits of the co-partnership scheme lately introduced, and in connection with this subject, the memory of the late Sir Geo. Livesey was not forgotten. It was happily observed that the mantle of Sir Geo. Livesey had fallen upon Mr. Corbet Woodall, who would be a leader in the 20th century just as Sir George had been the ornament of the 19th. Perhaps some apology is called for, in giving prominence to something of the nature of a family affair. But it is impossible for any gas worker to avoid something more than a passing interest in such an event as a gathering of over 7,000 gas workers, with their wives, at the invitation of their employers. We may confidently hope that the increased growth and prosperity of the Gas Light and Coke Company, which has been remarkable over the last 10 years in particular, will continue, and that the second century will be as prosperous as the first.

Management & Commercial Methods.

KEEPING UP A GAS RANGE.—"Elizabeth Lee," in a recent number of "The Globe," writing on "The care of a Gas Range," says:

I have received several letters asking what kind of blacking should be used for a gas range, and in reply would say blacking of any kind should never be used on a gas stove at any time. This is gas range weather, and a few hints as to the care of this useful article may be timely. The different parts of a gas stove should be washed only, not blacked, if only for the reason that it clogs the burners, which in time interferes with the same.

The stove should be preferably warm when cleaned. Wipe off the burners with a rag, and if they have burned red rub again with an oily rag. This will make them black. Very greasy parts of the stove should be washed in a strong solution of washing soda, using very hot water. If the stove is cold when cleaned the parts are apt to rust. After using the oven is a good time to clean the stove, because every part of it will be warm.

Quite a good deal of grease collects on the sides and top of the oven, especially the latter. When in excess a smoke will issue from the oven door. In fact, I know of one case where the grease had accumulated in such quantities as to drop on a fine pan of biscuits. This revealed the state of things to the inexperienced housekeeper, and she promptly used first old newspapers for taking the worst part of the grease, afterward washing thoroughly with hot soda water and a good soap. The air spaces back of the keys should be kept in good condition by wiping with a damp cloth occasionally, otherwise the flame will not be clear and bright. The racks in the oven and broiler being removable can be kept clean without much trouble. A common kitchen scrubbing brush, with plenty of soap and water, will do this. If the oven door is lined with a bright metal, a little whiting mixed with water and a few drops of ammonia will keep it clean if applied with with a rag, then wiping off again when the paste is quite dry. In lighting a gas stove oven or broiler the door should always be opened before applying the match. If this is omitted an explosion will take place. Many young housekeepers have never learned this (June brides please take notice). Another thing to be remembered is to leave the door ajar when meat is being broiled. I have broiled with the door closed, but I have also had the meat catch on fire because I did not leave the door open. If there is much fat on the meat it is almost sure to catch. A little water put into the dripping pan will help to cool the fat, but the safest plan is to leave the door slightly open. I like a hot oven for broiling, so turn on both burners when first lighting. Then I put in the meat, leaving the door open, and in about 2 minutes' time turn off one burner. The gas is lighted about 10 minutes before putting in the meat. Irons should never be heated directly over a gas flame, because a vapor which comes from the gas is apt to rust them.

The most economical way of doing an ironing with gas is to light

one burner and cover it with an iron plate with holes around the edge. These cost 10 cents and will take 3 irons at a time. Then if the whole is covered with an ordinary tin dish, such as is used in every kitchen, not one bit of heat will escape.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 20 cents.

I,031,696. Meter. R. L. Dezendorf, Richmond Hill, N. Y.

1,031,709. Gas Generator. N. Goodyear, New York City, assignor to Maine Development Corporation.

1,031,781. Process of Producing Gas. F. E. Fink, Bucyrus, O.

1,031,816. Gas Producer. J. H. Grissinger, Wellington, O.

1,032,194. Automatic Gas Valve. R. T. Evans and W. G. Nord, Youngstown, O.

1,032,203. Electric Gas Lighter. H. D. Grinnell, Pittsfield, Mass.

1,032,325. Multiple Burner Incandescent Lamp. R. D. Cody, Detroit, Mich., assignor to S. Stein, New York City.

1,032,695. Gas Furnace. G. H. Minier and T. Lowe, South Pasadena, Cal.

1,032,727. Electric Gas Igniter for Hot Water Circulating Systems. G. W. Appler, Lyons, N. Y.

1,032,791. Gas Lighting Apparatus. A. R. Walker, St. Louis, Mo., assignor to Windhorst & Company, same place.

1,032,860. Gas Burner. M. A. Possons, Cleveland, O., assignor to American Stove Company, St. Louis, Mo.

1,032,972. Automatic Cut Off Valve for Gas Stoves. J. S. Vollmer, Newark, O.

Items of Interest
FROM VARIOUS LOCALITIES.

WRITE to the "Master Mind" of the Publicity Department of the Pittsburgh (Pa.) Water Heater Company for a copy of his folder sticker. It is an information carrying sticker of a verity, in fact it is as its compiler asserts, very close with its information, and certain to be read. And, as he further says, "A gas bill sticker is very much like a postage stamp—it sticks to a thing, until it gets there, and by 'there' is meant the purchasing agent of the house."

THE Kentucky Public Service Company has awarded a contract to the Gas Machinery Company, of Cleveland, O., for a complete new coal gas plant, to be erected in new buildings now being constructed at Bowling Green, Ky. The new apparatus includes benches with silica retorts and settings, exhausting, condensing and scrubbing machinery, purifiers, station meter, governors and all works' connections. The new gas plant will be located adjoining the electric station.

MR. LOUIS N. RANCKE, General Manager of the Vulcan Firebrick Company, of Wilmont, Va., and Baltimore, Md., reports business brisk, with an outlook that would please a confirmed optimist. Judging from the lines of his communication, it is not at all unlikely that the Vulcan folks will speedily have a try at the gas end of the trading; especially in respect of the firebrick division of the trading.

THE sub-Committee of Congress, charged with the investigating of the gas supply of Washington, the "Managing Mind" of which is Congressman Lobeck, certainly seems to have a fair initiative grasp of the subject, for he recently remarked in connection with the investigation of the affairs of the named gas supply: "We need the advice of men who know all about gas, and who will investigate the situation entirely. I am ready to recommend such an inquiry. Witnesses appear before the District Committee and urge 75-cent gas, but they come without expert knowledge, and we should know, from the testimony of competent gas experts if the Company can really furnish gas at these low prices and still make a profit.

A CORRESPONDENT in Schenectady, N. Y., writing under date of the 17th July, says: "Mr. W. P. Moran, since 1907 connected with the gas sales department of the Mohawk (N. Y.) Gas Company, left here the 13th inst. to assume the post of Manager to the Empire Gas and Electric Company, with headquarters at Auburn, N. Y. As, of course, you know this concern is the operator of the plants at Waterloo, Geneva, Seneca Falls and Auburn, and it gives me genuine pleasure to state that his advancement comes as the reward, well earned, of many years of faithfulness and hard work. For some time he has been in charge of all the new building work of the Mohawk Gas Company, and a number of the local contractors who are continually building houses, have left the entire matter of gas furnishings to Mr. Moran's judgment. Mr. Moran's departure, of course, will cause regret to his many friends, but that regret will later on be succeeded by satisfaction in knowing that his future grows brighter everyday in his new field of work."

THE increases of the Consolidated Gas, Electric Light and Power Company, of Baltimore, Md., were amazing, as witness some facts culled from the semi-annual report, covering the 6 months ended the 30th ult.:

The gain (net) in new customers in the electric division of its business was 1,617 against 1,003 in 1911, and 762 for 1910. The net increase was, respectively: 1,678, 2,613 and 3,510. In the gas end of the business, the consumers increased in the 3 years 13,317 to 21,118. Better still, increase per meter on the gas division was not far from 7.9 per cent.

MR. FRED. W. FREESE, who has the contract for constructing the buildings of the Edwardsville (Ills.) Gas Company, had all the brickwork completed by mid-July, in so far as the structures are concerned, and the mason work on the tanks will be finished by mid-August. The Freese folks will also put down the gas mains, the contract on this account calling for the placing of at least 6 miles of pipe by September 1st.

WE understand that the American Gas Company has secured control of the water powers in and about Bolton and Middlesex, Vt. The tentative plan is to connect these powers with its third source, at Essex Junction, and will consolidate the trio with the purpose of furnishing power to Barre, Vt., and the immediate vicinity.

MR. W. H. YOCUM, the alert Manager of the Annville and Palmyra (Pa.) Gas Company, as the result of a close personal inspection of the territory involved, has recommended that these settlements be added to the Company's line system: Derry Church, Union Deposit and Campbelltown. At present the Company is supplying gas to the residents of Palmyra, Annville, Hershey and Hummelstown, 21 miles being in circuit. Since March last the increase in the Company's sendout has considerably more than doubled.

MR. THOMAS D. MILLER, writing under recent date, informs us that the Consolidated Coal Company, the headquarters of which are in the Fisher Building, Chicago, and which concern, in so far as its Western management is concerned, is in charge of Mr. Edward M. Mancourt, is gaining ground all the time. The Company is the active representative of these coals: Georges Creek, Big Vein Cumberland, Fairmount gas, By-Product and Domestic, Somerset Smokeless, Stearns' and Miller's Creek Block. Mr. T. D. Miller's place in the Company will be to take charge of the introduction and sale of its gas coals mined in the Elkhorn district, Eastern Kentucky.

AT the annual meeting of the Red Bank (N. J.) Gas Company, a minor member of the Consolidated Gas Company, of New Jersey, the officers elected were: B. J. Parker, Jno. S. Applegate, Sr., and F. W. Hope; President, B. J. Parker; Treasurer, J. S. Applegate; Secretary, F. W. Hope.

AT the annual meeting of the Consolidated Gas Company, of New Jersey, no change was made in the executive management thereof.

NOW it looks that Corpus Christi, Tex., will have gas "in its midst" before the winter is over, for this reason: Mr. W. B. Tuttle and associates, of San Antonio, Tex., have applied for a charter right. They ask for a life of 27 years, and agree to supply gas capable of yielding 600 B. T. U.'s, at the gross rate of $1.50 per 1,000 cubic feet. It was further provided that if in anyone month the output amounted to 500,000 cubic feet, the rate would not exceed $1 per 1,000.

THE Staunton (Va.) Gas Company—heretofore under the control of Messrs. E. M. and J. S. Funkhouser, J. H. Woodward and S. D. Ferguson—has been purchased by a Philadelphia-Baltimore syndicate, the controllers of which are Messrs. M. F. Maury, E. E. Mandeville and John J. Riordan. On the reorganization these officers were elected: President, E. E. Mandeville; Secretary and Treasurer, M. F. Maury.

AT the annual meeting of the Municipal Gas Company, of Albany, N. Y, these officers were elected: Directors, Messrs. Anthony N. Brady, R. C. Pruyn, Jno. Bowe, Ed. B. Cantine, Jno. A. Delehanty, Chas. Gibson and James R. McEwan; Inspectors of Election, J. W. Cox, H. W. Lipman and G. T. Kelly.

AT the last meeting of the Lansing (Mich.) Fuel and Gas Company these officers were elected: President, C. H. Geist; Vice-President, C. H. Weak; Secretary, J. W. Parmalee; Treasurer, B. F. Davis; Assistant Secretary and Treasurer, H. A. Lang.

MR. EDMUND O. HOWELL, JR., Borough Clerk, Borough of Avalon, N. J., informs us that the authorities of the named place are contemplating the erection of a gas plant to be operated on municipal account; and they will be pleased to hear from engineers and contractors performing this sort of construction.

"V. A. W.," writing from Dubuque, Ia., under date of the 18th inst., says: "Mr. J. D. Scott, of the erecting engineering force of the United Gas Improvement Company, arrived in Davenport this week, to supervise the erection of an improved Lowe water gas apparatus in the works of the Peoples Light Company, of the named city. The generator will be up to an output per day of 1,300,000 cubic feet, which provision will nearly double the output of the Company's water gas section—mind you; the business here has grown to such an extent that the present huge apparatus is just the duplicate of its forerunner, which was erected to all intent a twelvemonth ago. Nor does the Company put all its eggs in a single conveyance, for it also has a set of coal gas apparatus that, in a pinch, could be depended on to send out 400,000 cubic feet every 24 hours. In addition to this, the persuading Superintendent, Mr. H. C. Blackwell—and no more popular man resides in Davenport—has prevailed upon the owner to put in complete equipment—plunge, shower and hot water—of baths for the workmen, with lockers and the like. I forgot to mention earlier that the plant provision also includes the setting of a new Sterling boiler up to 200 horse power. It is expected that the plant in its new shape will be ready for active work by September 10th."

MR. JOSEPH DUNKLE, Manager of the Lawrence (Kas.) Gas Company, when asked some days ago for an opinion respecting the likelihood of an ample gas supply of the natural sort in the Lawrence district during the coming fall, said: "I expect to know something more definite by the middle of next month regarding the amount of gas that may be expected for this winter and will give out a statement then. But just now I can say nothing, but that it is a wise precaution to take and have a little coal or wood handy if the gas fails."

MANY will be glad to know that Mr. Norman Kenan, Secretary of the Cincinnati (O.) Gas and Electric Company, is again actively engaged in business, having altogether recovered from an operation for appendicitis that he underwent some weeks ago.

THE Business Men's Association (Wm. Hall, President), of Aledo, Ills., is considering the advisability of constructing a gas plant for operation on public account. Our correspondent adds: "It is a certainty that over 400 separate subscriptions can be readily secured pledging the signers to use gas; and as Aledo is peopled by a lot of wealthy folks who would be liberal users, it is a certainty that the plant will be constructed."

THE Boston "News Bureau" says that the Light, Heat and Power Corporation, of Boston, which is the construction division of the Massachusetts Lighting Companies, is under contract to build a complete plant at Daytona, Fla.

THE Adirondack Electric Power Company has notified Superintendent Anderson that the Directors have authorized an expenditure of $20,000 for reconstructing the gas plant in Oneida, N. Y.

THE Goshen (N. Y.) Illuminating Company has been granted a franchise by the Board of Trustees of the village of Walden, to operate a gas supply in Walden, Campbell Hall, Maybrook and Montgomery. The gas will be manufactured in Goshen, and piped over to Walden, the intervening distance being 8 miles or so. Two of the parties in interest are Messrs. James Findlay and B. J. McDonald, of Newburgh, N. Y.

A HOLDER up to retaining 1,000,000 cubic feet will be built this summer for the better and safer supply of gas to the residents of Pasadena, Cal.

THE American Power and Light Company has purchased the plant and properties of the Vancouver (B. C.) Gas Company. The controllers of the succeeding corporation are: Messrs. C. R. Young and H. E. Maghum, of Portland; and J. L. Stapleton, of Vancouver.

IN the proposal for the public lighting of Hackensack, N. J., the Public Service Gas Company offered to carry on the lighting at these prices: Single mantle lamps, $28 per year for first 50 lamps; from 50 to 150 lamps, price $27 per lamp; for all over 150 lamps, $26 each—a 4,000-hour schedule to obtain.

THE proprietors of the Manufacturers' Light and Heat Company, and of the Tri-State Gas Company, both supplying natural gas in and around Pittsburgh and McDonald districts in Pennsylvania, have notified the residents that: "In order to maintain the efficient service of the past, and owing to the increased cost of obtaining an adequate supply of natural gas," it has been found necessary to increase the selling rate to 32 cents per 1,000 cubic feet, less 2 cents per 1,000 for prompt settlement of accounts. The minimum rate has been abolished.

THE Mayor of Louisville (Mr. W. O. Head) has announced that he will agree to sell the holdings of the city in the shares of the Louisville Gas Company, provided the purchasers will pay $150 per share therefor. The city's ownership in the Company is 9,250 shares, par value $100. It will likely be remembered that when the Byllesby interests several months ago succeeded in securing control of the Company, the city was offered the same price that was offered other shareholders. That is, $120 per share.

THE Seneca (N. Y.) Gas Company has been incorporated by Messrs. A. D. Jamison, Jos. M. Maher, J. T. Lyman and Chas. A. White, of Buffalo; and M. W. Nenno, of Hamburg, N. Y.

The Union Gas and Electric Company, of Cincinnati, reports that during the quarter ended June 30th its gross earnings amounted to $465,178.18. Last year for the corresponding quarter the earnings were $2,764 less. The Company pays into the city treasury, in the nature of a royalty, the sum of 1 per cent. on the gross.

THE following is the new selling schedule announced by the proprietors of the Towanda (N. Y.) Gas Company, which is to be effective the 1st prox.: Gross, $1.85 per 1,000 cubic feet, with 10 cents per 1,000 off for prompt payment; over 4,000 and up to 10,000 cubic feet per month, $1.75, less 10 cents; over 10,000 cubic feet per month, $1.50, net.

THE City Council, of Gainesville, Fla., has adopted an ordinance creating the office of inspector of gas piping, electric wiring, the proving of gas and electric measuring devices, etc. In respect of the gas meter section, it is specified that if a meter is found incorrect, to the extent of 2 per cent., the person, firm or corporation owning such meter shall, upon conviction before the Mayor, be punished by a fine of $200, or be imprisoned not exceeding 60 days! How's that! If the meter complained of is shown by test to be correct within 2 per cent limits, the person requesting such test shall pay to the inspector a fee of $1.

MR. J. A. DANIELS has succeeded Mr. W. P. Moran in the post of manager of the commercial division of the business of the Schenectady branch of the Mohawk (N. Y.) Gas Company.

THE Public Service Commission, up-State division, has, after protracted hearing, ordered the Cooperstown Gas Company to forthwith make such changes in its plant as will enable it to make gas in quantity and quality suitable to the needs of its consumers.

The Market for Gas Securities.

The extra dividend expecters amongst the shareholders in the Consolidated Gas Company were doomed to disappointment, for the regular meeting for the quarter was notable for the absence of four of the "big men" from the gathering. Of course, this absence is put forward as a reason by the "lesser ones" who, attended the meeting yesterday for merely declaring the usual dividend—1¼ per cent. for the quarter, and made payable September 16th to holders of record as of the 14th prox. But the "big men" passed the matter up prior to yesterday; so to what avail was their non-presence at headquarters last Thursday. The suggestion that their absence had any qualifying effect in the action taken causes the well-known Roman query "Quid rides?" to be in order. Of one thing the shareholders may rest assured, that that rate of dividend was of a verity earned. The stock opened to-day (Friday) at 144¼ to 145.

Brooklyn Union holds well up to recent quotations, a state of affairs not calculated to cause wonder, when one remembers that present quotations as to actual values in the shares are at least as 1 is to 2. Peoples, of Chicago, under the present executive management, maintains its advance, and we have no hesitation in saying that this excellent security will easily see 125 prior to September 1st. Lacledes are steady, which like determination applies to all accredited gas securities.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

JULY 29.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	144¼	145
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	3,000,000	1,000	103	105
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	105	106
Mutual Gas Co.	3,600,000	100	190	225
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	101	102½
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98¼	100½
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	95	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	100	109
Standard	5,000,000	100	60	70
Preferred	5,000,000	100	90	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	145	146
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¾	107
Yonkers	299,650	500	180	—
Out-of-Town Companies.				
Bay State	50,000,000	50	⅛	⅝
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	97	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,660,000	1,000	104	106¼
Cincinnati Gas and Electric				
Co.	29,500,000	100	87	90
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. &				
Heating Co.	1,682,750	100	90½	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	13,460,084		—	—
Mortgages, 5's	3,400,000		—	—
General Mortgage 4½	10,661,000		—	—
Con. Gas Co., Baltimore				
City, 4½	2,751,000		—	—
Essex and Hudson Gas Co.	6,500,000	—	133	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co.,				
1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	130	133
" Bonds, 5's	10,500,000	—	101	106
Indianapolis	2,000,000	—	—	38
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	91	95
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	86
Bonds, 1st 5's	3,322,000	1,000	99	102
Laclede Gas Co., St. Louis.	10,000,000	100	106	106½
Preferred	2,500,005	100	90	91½
Bonds	10,000,000	1,000	102¾	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	128	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	106	
Massachusetts Gas Companies, of Boston	25,000,000	100	89½	90
Preferred	25,000,000	100	96	97
Montreal Gas Co., Canada	3,000,000	100	233	236
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	5,000,000	25	189	190
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	116¼	116½
1st Mortgage	20,100,000	1,000	103	103½
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105½
Pacific Gas and Electric Co.	15,500,000	—	65	66
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	96	98
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	3,447,000	1,000	94	96
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,600,000	200	420	425
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	—	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October 16 to 18, 1912. Marlborough-Blenheim Hotel, Atlantic City, N. J. Officers: President, Ira C. Copley, Aurora, Ills. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting and Gas Show, Toronto, Aug. 26th to Sept. 7, 1912. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct. 1912. Officers: President, R. M. Searle, Rochester, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street, New York City.

Gas Meters.—Monthly meetings. Chairman, Will W. Barnes; Commissioners, W. H. Pettes, I. W. Peffly; Secretary, H. Thurston Owens, 42 Pine street, New York City.

Guild of Gas Managers of New England.—Annual meeting, March, 1913. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, March 19th and 20th, 1913. Chicago, Ills. Officers: President, H. O. Channon, Quincy, Ills.; Secretary-Treasurer, Horace H. Clark, 115 No. Oak Park avenue, Oak Park, Ills.

Illuminating Engineering Society.—Annual meeting, Niagara Falls, Canada, Sept. 16-19, 1912. Meetings of Sections, monthly. Pres't, V. R. Lansingh, New York City; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York, Secretary, C. L. Law, 124 West 42d street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, J. B. Jackson, 28 North Market street. Pittsburgh, Secretary, J. C. Mundo, Oliver Building.

Indiana Gas Association.—Annual meeting, March, 1913, Indianapolis. Officers: President, Howard L. Olds, Indianapolis; Vice-President, Wm. Wallace, Lafayette; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, Burlington, Ia., May, 1913; Officers: President, C. W. Fair, Atlantic, Ia.; Secretary, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, October 17-19. Manhattan, Kas. Officers: President, B. F. Eyer, Manhattan, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association.—Annual meeting, September 4-6, 1912; Toronto, Canada. Officers: President, F. W. Blowers, Kalamazoo, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1913; Joplin, Mo. Officers: President, P. A. Bertrand, Joplin, Mo.; Secretary and Treasurer, P. W. Markham, Brookfield, Mo.

National Commercial Gas Association.—Annual meeting and Gas Show, Dec. 2-5, 1912. Atlanta, Ga. Officers: President, C. L. Holman, St. Louis, Mo.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, Cleveland, O., May, 1913; Officers: President, M. B. Daly, Cleveland, O; Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, February, ——— 1913 Boston. Officers: President, D. D. Barnum, Worcester, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—Summer Meeting. Sept. 21, Atlantic City, N. J.—President, William H. Pettes, Newark, N. J.; Secretary-Treasurer, Arthur H. Osborn Belmar, N. J.

Ohio Gas Association.—Annual meeting, February ———, 1913, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

Oklahoma Gas, Electric and Railway Association.—Annual meeting, May, 1913. President, Noel R. Gascho, Alva, Okla.; Secretary, H. V. Bozell, Norman, Okla.

Pacific Coast Gas Association.—Annual meeting, San Diego, Cal., September 17, 18, 19, 1912. Officers: President, W. Baurhyte, Los Angeles, Cal.; Vice President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, York, Pa., April, 1913; Officers, President, H. H. Ganser, Norristown, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting Dec., 13, 1912; monthly meetings, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city

Southern Gas Association.—Annual meeting, April ——— 1913, Charlotte, N. C. Officers: President, C. E. White, Montgomery, Ala.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting, April———1913, Galveston, Tex. Officers: President, F. M. Lege, Jr Dallas, Tex.; Secretary, H. S. Cooper, Galveston, Tex.

Wisconsin Gas Association.—Annual meeting, May ——— 1913, Milwaukee, Wis. Officers: President, I. F. Wortendyke, Janesville, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.